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Non-pharmaceutical ophthalmic solutions: A catalogue of name brand products and their generic equivalents

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Non-pharmaceutical ophthalmic solutions: A catalogue of name brand products and their generic equivalents

Abstract
The purpose of this thesis is to present an organized catalogue of non-pharmaceutical ophthalmic products. Categories include contact lens care systems for soft and gas permeable lenses, artificial tears, and rewetting drops. Name brand and generic products are grouped based on their contained ingredients. Products in this guide were purchased, photographed, and their ingredients determined. Sources for determining the solutions' contents included the package inserts and directly contacting the product manufacturers. In addition to listing the ingredients, the purpose of each ingredient is also indicated in the guide. It should be noted that the generic brands were gathered from the Portland, Oregon area and may not include some brands carried by stores in other areas. Accompanied by digital pictures, ingredients, and generic equivalents for name brands, this guide is intended to assist the optometric physician in making informed decisions regarding their patients' eye care solutions.

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NON-PHARMACEUTICAL OPHTHALMIC SOLUTIONS:
A CATALOGUE OF NAME BRAND PRODUCTS AND THEIR
GENERIC EQUIVALENTS

By
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CARI GOYA

A thesis submitted to the faculty of the
College of Optometry
Pacific University
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for the degree of
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ABSTRACT

The purpose of this thesis is to present an organized catalogue of non-pharmaceutical ophthalmic products. Categories include contact lens care systems for soft and gas permeable lenses, artificial tears, and rewetting drops. Name brand and generic products are grouped based on their contained ingredients.

Products in this guide were purchased, photographed, and their ingredients determined. Sources for determining the solutions' contents included the package inserts and directly contacting the product manufacturers. In addition to listing the ingredients, the purpose of each ingredient is also indicated in the guide. It should be noted that the generic brands were gathered from the Portland, Oregon area and may not include some brands carried by stores in other areas.

Accompanied by digital pictures, ingredients, and generic equivalents for name brands, this guide is intended to assist the optometric physician in making informed decisions regarding their patients' eye care solutions.

Key Words:
Contact lens solutions
Contact lens cleaners
Contact lens disinfectant solutions
Ophthalmic solutions
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Ingredient Category Descriptions

Preservatives: these prevent solution contamination by resisting microbial growth and provide disinfecting properties during lens storage. Sometimes chelating agents (which bind metal ions needed for microbial growth) are listed as preservatives, the most common being EDTA or edetate disodium. Sometimes these solutions are advertised as “preservative-free” even though there is EDTA in the solution.

Disinfectants: these are similar to preservatives and the two categories are often blended together. The point of distinction is that disinfectants remove microorganisms from the contact lens while preservatives simply prevent their growth in solution. Sometimes disinfectants are just preservatives in higher concentrations.

Buffers: these are either alkaline or acidic salts used to maintain the solution's pH. pH has much to do with ocular comfort (solutions with a pH close to 7.0 are the most comfortable). The life of the solution is prolonged by the use of buffers.

Viscosity: these agents add a slippery quality to the product. By increasing the viscosity of the product, the contact time with the lens is increased and friction between the lens and the eye or the lens and the hand is reduced.

Surfactants: these are cleaners. Surfactants reduce the surface tension of the product, which allows it to spread out over the lens easily. They act as detergents, removing microorganisms, debris, and other impurities by surrounding them in a micelle, which is easily removed by water.

Stabilizers: these prevent ingredients in the solution from degrading or dissociating. Often it is hydrogen peroxide that is being stabilized to prevent it from degrading prematurely. Therefore, these agents prolong the life of the product.

Tonicity: this is dependent on the amount of salt in the solution (NaCl). The tears contain 0.9% NaCl. Most solutions intended for use in the eye are also 0.9% NaCl, which makes them isotonic. Hypertonic solutions contain more salt and hypotonic solutions contain less. Isotonicity helps maintain ocular comfort on contact with the eye.

Abrasive Cleaner: these are present in gas permeable lens cleaners. They buff away deposits on the lens. Care must be taken to educate the patient not to rub too hard; this can result in lens power changes over time.

Neutralizers: these are used to transform a product that cannot comfortably be in the eye into one that can. They most often work on hydrogen peroxide, changing it into water and oxygen gas. They usually require a minimum of 6 hours to completely neutralize the solution.
Tint: sometimes tint is added to a solution when it is important for the patient to be able to visualize the product on the lens. For instance, to make sure all of the solution is washed off the lens before insertion.

Antioxidants: added to maintain the solution by preventing oxidation damage, which could degrade to solution. Thus, these ingredients help to prolong the life of the product.

Metabolites: these ingredients are sometimes added to solutions. The manufacturers claim these may improve eye health.

NSAID: non-steroidal anti-inflammatory agents are occasionally added. There are some studies that suggest that these may inhibit cataract formation and progression.

Cooling: menthol adds a cool sensation on instillation into the eye.
Saline Solutions

Saline solutions are intended for the purpose of rinsing contact lenses. They are not intended, but are commonly used, for cleaning and storing contacts. Saline can be used to rinse lenses after cleaning in order to remove microorganisms and deposits that the cleaner may have loosened. Rinsing has been demonstrated to decrease the amount of microorganisms on a lens by 2 log units (100 times less). Saline should also be used to rinse the lenses before inserting them in the eye.

Saline solutions can be preserved or preservative free. All aerosol spray salines are preservative free. Bottle salines are generally preserved. Preservatives help to keep microorganisms from growing in the solution, but may cause sensitivity reactions in some individuals. Some saline solutions contain preservatives that are broken down in the eye or upon exposure to light (these may be labeled as preservative free). In either case, care must be taken to prevent contamination of bottle saline solutions. Patients must be instructed not to touch the bottle tip to the eye, contact lens, or finger and to keep the cap on the bottle whenever it is not being used.

The best method for rinsing a contact lens while minimizing the chance for contamination is to place the lens in the palm of the hand and to squirt saline onto the lens. Then the lens is rubbed front and back to remove any debris.

In addition to preservatives, saline solutions contain buffers to maintain the saline's pH. Rarely, a stabilizer may be added to keep the solution's contents from being degraded.
Alcon Saline Solution

Preservative(s): sorbic acid 0.125%, edetate disodium 0.1%
Buffer(s): boric acid, sodium borate
Stabilizer: none
Tonicity: isotonic
Allergan Lens Plus Saline Solution (Aerosol)

Preservative(s): preservative free
Buffer(s): boric acid
Stabilizer: none
Tonicity: isotonic
CIBA Softwear Saline

Preservative(s): generates hydrogen peroxide up to 0.006%
Buffer(s): boric acid, sodium borate, sodium perborate
Stabilizer: phosphonic acid
Tonicity: isotonic
Bausch & Lomb Saline Spray (Aerosol)
CIBA Vision Saline (Aerosol)

Preservative(s): preservative free
Buffer(s): boric acid, sodium borate
Stabilizer: none
Tonicity: isotonic
Bausch & Lomb Saline Solution
Equate Saline Solution

Preservative(s): sorbic acid 0.1%, edetate disodium 0.025%
Buffer(s): boric acid, sodium borate
Stabilizer: none
Tonicity: isotonic
Preservative(s): sorbic acid 0.1%, edetate disodium 0.1%
Buffer(s): boric acid
Stabilizer: none
Tonicity: isotonic
Equate Saline Solution (Aerosol)
Kroger Saline Solution (Aerosol)
Perfect Choice Saline Solution (Aerosol)

Preservative(s): preservative free
Buffer(s): boric acid, sodium borate
Stabilizer: none
Tonicity: isotonic
American Fare Saline Solution
Kroger Saline Solution
Longs Saline Solution
Perfect Choice Saline Solution
Rite-Aid Saline Solution
Safeway Saline Solution
Sav-on Osco Saline Solution
Target Saline Solution
Top Care Saline Solution
Walgreens Saline Solution

Preservative(s): sorbic acid, edetate disodium
Buffer(s): boric acid
Stabilizer: none
Tonicity: isotonic
Artificial Tears
Artificial Tears

Artificial tears, or lubricating drops, are designed to add moisture to the eyes when they become dry or gritty. They are NOT designed to be used with contact lenses, although it is not uncommon to see them used in such a manner. Care must be taken to avoid contact of the dropper tip with the lashes, eye, or fingers in order to prevent contamination of the bottle.

Aside from the relief of dry eye symptoms, artificial tears are used to relieve symptoms from conjunctivitis (bacterial, viral, allergic, etc.), pinguecula, pterygiums, and other ocular conditions that cause discomfort. If the drops are to be used more than 4 times a day, a preservative-free artificial tear is recommended.

Most artificial tears contain buffers to maintain pH and viscosity agents to increase lubrication properties. They may be preserved or non-preserved. Most non-preserved types some in individual vials designed for one-time use. Rarely, a stabilizer may be added to prevent any degradation of the bottle contents.
Thera Tears Lubricant Eye Drops
(Advanced Vision Research)

Preservative(s): preservative free ("Dequest" becomes preservative free in the eye)
Viscosity: sodium carboxymethylcellulose 0.25%
Buffer(s): sodium perborate, boric acid, calcium chloride, potassium chloride, sodium bicarbonate, calcium chloride, magnesium chloride, sodium phosphate
Surfactant(s): none
Stabilizer: none
Bion Tears Lubricant Eye Drops (Alcon)

Preservative(s): preservative free
Viscosity: Dextran 70 0.1%, hydroxypropyl methylcellulose 2910 0.3%
Buffer(s): hydrochloric acid, sodium hydroxide, carbon dioxide
Surfactant(s): none
Stabilizer: none
Systane Lubricant Eye Drops (Alcon)

Preservative(s): Polyquad 0.001%
Viscosity: polyethylene glycol 400 0.4%, propylene glycol 0.3%, hydroxypropyl guar
Buffer(s): boric acid, calcium chloride, magnesium chloride, potassium chloride, zinc chloride
Surfactant(s): none
Stabilizer: none
Tears Naturale Forte (Alcon)

Preservative(s): Polyquad 0.001%, glycine
Viscosity: Dextran 70 0.1%, hydroxypropyl methylcellulose 0.3%, glycerin 0.2%, polysorbate 80
Buffer(s): boric acid, calcium chloride, hydrochloric acid, sodium hydroxide, magnesium chloride, potassium chloride, zinc chloride
Surfactant(s): none
Stabilizer: none
Tears Naturale II Polyquad (Alcon)

Preservative(s): Polyquad 0.001%
Viscosity: Dextran 70 0.1%, hydroxypropyl methylcellulose 2910 0.3%
Buffer(s): potassium chloride, sodium borate, hydrochloric acid, sodium hydroxide
Surfactant(s): none
Stabilizer: none
Refresh Endura (Allergan)

Preservative(s): preservative free
Viscosity: glycerin 1%, polysorbate 80 1%, Carbomer, castor oil
Buffer(s): sodium hydroxide
Antioxidant: mannitol
Surfactant(s): none
Stabilizer: none
Allergan Refresh Plus

Preservative(s): preservative free
Viscosity: carboxymethylcellulose sodium 0.5%
Buffer(s): calcium chloride, magnesium chloride, potassium chloride, sodium lactate
Surfactant(s): none
Stabilizer: none
Tonicity: isotonic
Celluvisc (Allergan)

Preservative(s): preservative free
Viscosity: carboxymethylcellulosesodium 1%
Buffer(s): none
Surfactant(s): none
Stabilizer: none
Computer Eye Drops (Bausch & Lomb)

Preservative(s): BAK 0.01%, edetate disodium

Viscosity: glycerin 1%

Buffer(s): boric acid, potassium chloride, sodium borate, hydrochloric acid, sodium hydroxide

Surfactant(s): none

Stabilizer: none
Moisture Eye (Bausch & Lomb)

Preservative(s): BAK 0.01%, edetate disodium
Viscosity: propylene glycol 1%, glycerin 0.3%
Buffer(s): boric acid, potassium chloride, sodium borate
Surfactant(s): none
Stabilizer: none
Preservative Free Moisture Eyes (Bausch & Lomb)

Preservative(s): edetate disodium
Viscosity: propylene glycol 0.95%
Buffer(s): boric add, potassium chloride, sodium borate, hydrochloric add, sodium hydroxide
Surfactant(s): none
Stabilizer: none
Moisture Eyes Protect (Bausch & Lomb)

Preservative(s): BAK 0.01%
Viscosity: Dextran 70 0.1%, hydroxypropyl methylcellulose 2910 0.8%, dextrose
Buffer(s): sodium phosphate (dibasic & monobasic), potassium chloride, hydrochloric acid, sodium hydroxide
Surfactant(s): —
Stabilizer: none
Aqua Site Lubricant Eye Drops (CIBA)

Preservative(s): preservative free, edetate disodium (disinfectant)
Viscosity: Dextran 70 0.1%, polyethylene glycol 400 0.2%, dextrose, polycarbophil
Buffer(s): sodium hydroxide
Surfactant(s): none
Stabilizer: none
GenTeal Mild (Novartis)

Preservative(s): preservative free ("GenAqua" sodium borate disappears in the eye)
Viscosity: hydropropyl methylcellulose 0.2%
Buffer(s): boric acid, calcium chloride dihydrate, potassium chloride
Surfactant(s): none
Stabilizer: phosphonic acid
Equate Artificial Tears

Preservative(s): BAK 0.01%, edetate disodium
Viscosity: propylene glycol 1%, glycerin 0.3%
Buffer(s): boric acid, potassium chloride, sodium borate, hydrochloric acid, sodium hydroxide
Surfactant(s): none
Stabilizer: none
Leader Artificial Tears Solution

Preservative(s): edetate disodium, BAK 0.01%
Viscosity: polyvinyl alcohol 1.4%
Buffer(s): phosphoric acid, sodium hydroxide, sodium phosphate (dibasic & monobasic)
Surfactant(s): none
Stabilizer: none
Leader Tears Pure

Preservative(s): edetate disodium, BAK 0.01%
Viscosity: hydroxypropyl methylcellulose 0.4%
Buffer(s): sodium phosphate (dibasic & monobasic), potassium chloride, hydrochloric acid, sodium hydroxide
Surfactant(s): none
Stabilizer: none
Longs Preservative Free Artificial Tears

Preservative(s): preservative free
Viscosity: Dextran 70 0.1%, hydroxypropyl methylcellulose 0.3%
Buffer(s): potassium chloride, sodium borate, hydrochloric acid, sodium hydroxide
Surfactant(s): none
Stabilizer: none
Nature's Tears (Mist)
(Bio-Logic Aqua Technologies)

Preservative(s): preservative free
Viscosity: none
Buffer(s): none
Surfactant(s): none
Stabilizer: none
Other: tissue-grade water (only ingredient)
Hypo Tears Lubricating Eye Drops (Novartis)

Preservative(s): edetate disodium, BAK
Viscosity: polyvinyl alcohol 1%, polyethylene glycol 400 1%, dextrose
Buffer(s): none
Surfactant(s): none
Stabilizer: none
Mini-Drops Eye Therapy (Optics)

Preservative(s): preservative free
Viscosity: propylene glycol, polyvinyl alcohol
Buffer(s): none
Surfactant(s): none
Stabilizer: none
Rite-Aid Revive Tears Lubricant Eye Drops

Preservative(s): preservative free ("Dissipate" peroxo complex changes into natural tears in the eye)

Viscosity: carboxymethylcellulose sodium 0.5%

Buffer(s): boric acid, calcium chloride, magnesium chloride, potassium chloride, sodium hydroxide

Surfactant(s): none

Stabilizer: none
Rhoto Zi For Eyes

Preservative(s): alcohol 0.1%, BAK
Viscosity: povidone 1.8%, polysorbate 80
Buffer(s): potassium chloride, sodium borate
Surfactant(s): Poloxamer 407
Cooling: camphor
Stabilizer: none
Schein Artificial Tears

Preservative(s): BAK, edetate disodium
Viscosity: polyvinyl alcohol 1.4%
Buffer(s): potassium chloride
Surfactant(s): none
Stabilizer: none
Preservative(s): edetate disodium, BAK
Viscosity: tetrahydrozoline hydrochloride 0.05%, polyethylene glycol 1%
Buffer(s): boric acid, sodium borate
Surfactant(s): none
Stabilizer: none
Visine Tears Dry Eye Relief

Preservative(s): BAK

Viscosity: polyethylene glycol 400 1%, glycerine 0.2%, hydroxypropyl methylcellulose 0.2%

Buffer(s): boric acid, ascorbic acid, disodium phosphate, sodium borate, sodium citrate, sodium lactate, magnesium chloride, potassium chloride

Metabolite(s): dextrose, glycine

Surfactant(s): none

Stabilizer: none
Viva Drops (Vision Pharmaceuticals)

Preservative(s): preservative free, edetate disodium (disinfectant)
Viscosity: polysorbate '80
Buffer(s): citric acid, sodium citrate
Antioxidant(s): pyruvate, vitamin A, mannitol, retinyl palmitate
Surfactant(s): none
Stabilizer: none
Home Best Artificial Tears
Murine Tears Natural Tears Formula
Valu-Rite Artificial Tears

Preservative(s): BAK 0.01%, edetate disodium
Viscosity: polyvinyl alcohol 0.5%, povidone 0.6%, dextrose
Buffer(s): potassium chloride, sodium bicarbonate, sodium citrate, sodium phosphate (dibasic & monobasic)
Surfactant(s): none
Stabilizer: none
GenTeal Lubricant Eye Drops (CIBA)
Equate Gentle Lubricant Eye Drops
Rite-Aid Gentle Lubricant Eye Drops
Sav-on Osco Gentle Lubricant Eye Drops

Preservative(s): preservative free ("Dissipate" perox complex changes into natural tears in the eye)

Viscosity: hydroxypropyl methylcellulose 0.3%

Buffer(s): boric acid, potassium chloride

Surfactant(s): none

Stabilizer: phosphonic acid
Tears Renewed (Akorn)
American Pare Artificial Tears
Longs Artificial Tears
Kroger Artificial Tears
Perfect Choice Artificial Tears
Rite-Aid Artificial Tears
Safeway Artificial Tears
Sav-on Osco Artificial Tears
Target Artificial Tears
Walgreens Artificial Tears

Preservative(s): BAK 0.01%, edetate disodium
Viscosity: Dextran 70 0.1%, hydroxypropyl methylcellulose 0.3%
Buffer(s): potassium chloride, hydrochloric acid, sodium hydroxide
Surfactant(s): none
Stabilizer: none
Rewetting Drops
Rewetting Drops / Lens Drops

Unlike artificial tears, rewetting drops are designed for use with contact lenses. Some are approved for soft lenses only, but several can be used with rigid lenses as well. Aside from the approval for lens use, rewetting drops can be used for the same purposes as artificial tears. In addition, they can be used to rewet lenses on the eye and, in many instances, to help keep the lenses clean throughout the day. As with artificial tears, if the drops are being used more than 4 times a day, a preservative free rewetting drop should be recommended.

Rewetting drops contain viscosity agents to improve lubrication, surfactants to help clean the lenses, buffers to maintain the pH, and, most often, a preservative to prevent contamination.
Clerz Plus Lens Drops (Alcon)

Preservative(s): edetate disodium 0.05%, Polyquad 0.001%
Viscosity: none
Buffer(s): citrate borate
Surfactant(s): PEG-11 lauryl ether carboxylic acid, Tetronic 1304
Tonicity: isotonic
Lens Types: soft contacts, RGP
Clerz 2 Lubricating & Rewetting Drops (Alcan)

Preservative(s): sorbic acid 0.1%, edetate disodium
Viscosity: hydroxyethylcellulose
Buffer(s): potassium chloride, sodium borate, boric acid, sorbic acid
Surfactant(s): Poloxamer 407
Tonicity: not stated
Lens Types: soft contacts, RGP
Complete Blink-n-Clean Lens Drops (Allergan)

Preservative(s): polyhexamethylenebiguanide 0.0001%, edetate disodium
Viscosity: hydroxypropyl methylcellulose
Buffer(s): tromethamine
Surfactant(s): tyloxapol
Tonicity: isotonic
Lens Types: soft contacts
Refresh Contacts (Allergan)
Refresh Tears (Allergan)

Preservative(s): Purite 0.005% (stabilized oxychloro complex)
Viscosity: carboxymethylcellulose 0.5%
Buffer(s): boric acid, calcium chloride, magnesium chloride, potassium chloride, sodium borate decahydrate
Surfactant(s): none
Tonicity: not stated
Lens Types: soft contacts, RGP
**Renu Multiplus Lubricating & Rewetting Drops** (Bausch & Lomb)

Preservative(s): edetate disodium 0.1%, sorbic acid 0.1%
Viscosity: povidone
Buffer(s): boric acid, sodium borate, potassium chloride
Surfactant(s): none
Tonicity: isotonic
Lens Types: soft contacts
**Renu Preservative Free Lubricating & Rewetting Drops**  
(Bausch & Lomb)

Preservative(s): preservative free  
Viscosity: hydroxypropyl methylcellulose 0.25%  
Buffer(s): boric acid, potassium chloride  
NSAID: bendazac lysine 0.25% (prevents cataracts)  
Surfactant(s): none  
Tonicity: isotonic  
Lens Types: soft contacts
Renu Rewetting Drops (Bausch & Lomb)

Preservative(s): edetate disodium 0.1%, sorbic acid 0.15%
Viscosity: none
Buffer(s): boric acid, sodium borate
Surfactant(s): poloxamine
Tonicity: isotonic
Lens Types: soft contacts
Focus Lens Drops (CIBA)

Preservative(s): edetate disodium 0.2%, sorbic acid 0.15%
Viscosity: carbamide
Buffer(s): boric acid
Surfactant(s): polyoxyethylene polyoxypropylene block copolymer
Tonicity: not stated
Lens Types: soft contacts, RGP
Clear Eyes Contact Lens Relief

Preservative(s): edetate disodium 0.1%, sorbic acid 0.25%
Viscosity: hydroxypropyl methylcellulose, glycerin
Buffer(s): boric acid
Surfactant(s): none
Tonicity: isotonic
Lens Types: soft contacts
Equate Sterile Lubricant & Rewetting Drops

Preservative(s): edetate disodium 0.1%, sorbic acid 0.15%, ethylene diamine
Viscosity: none
Buffer(s): boric acid, sodium borate
Surfactant(s): polyoxyethylene polyoxypropylene block copolymer
Tonicity: isotonic
Lens Types: soft contacts
Longs Lubricating & Rewetting Drops

Preservative(s): edetate disodium, polyhexamethylenebiguanide 0.0001%
Viscosity: none
Buffer(s): tromethamine
Surfactant(s): tyloxapol
Tonicity: isotonic
Lens Types: soft contacts
Visine For Contacts

Preservative(s): edetate disodium
Viscosity: hydroxypropyl methylcellulose, glycerin
Buffer(s): boric acid, potassium sorbate
Surfactant(s): none
Tonicity: isotonic
Lens Types: soft contacts
Opti-Free Express Rewetting Drops (Alcon)
Opti-One Rewetting Drops (Alcon)
American Fare Rewetting Drops
Kroger Rewetting Drops
Longs Rewetting Drops
Perfect Choice Rewetting Drops
Rite-Aid Rewetting Drops
Safeway Rewetting Drops
Sav-on Osco Rewetting Drops
Target Rewetting Drops
Walgreens Rewetting Drops

Preservative(s): edetate disodium 0.05%, Polyquad 0.001%
Viscosity: none
Buffer(s): citrate borate
Surfactant(s): none
Tonicity: isotonic
Lens Types: soft contacts
Gas Permeable Lubricating Drops
Gas Permeable Lens Rewetting Drops

There are only a handful of rewetting drops designed for gas permeable lenses only. These drops serve the same purpose as the rewetting drops for soft lenses. They keep the lenses wet and clean. Flus, remember that a handful of the soft lens rewetting drops can be used for gas permeable lenses also.

The drops contain buffers to maintain the solution pH, preservatives to prevent contamination, and viscosity agents to improve lubrication.
Boston Rewetting Drops (Polymer Tech)

Preservative(s): chlorhexidine gluconate 0.006%
Viscosity: polyvinyl alcohol, hydroxyethylcellulose
Buffer(s): none
Antioxidant: none
Tonicity: hypertonic
Lens Types: silicone & fluorosilicone acrylates
Hard Contact Lens Sterile Wetting Solution (Lobob)

Preservative(s): BAK 0.01%, sodium edetate 0.025%
Viscosity: none
Buffer(s): none
Antioxidant: sodium bisulfite 0.02%
Tonicity: not stated
Lens Types: silicone & fluorosilicone acrylates
Optimum Wetting & Rewetting Drop (Lobob)

Preservative(s): sorbic acid 0.05%, benzyl alcohol 0.1%, disodium edetate 0.1%
Viscosity: polyvinyl pyrrolidone, polyvinyl alcohol, hydroxyethylcellulose
Buffer(s): sodium carbonate, potassium chloride
Antioxidant: none
Tonicity: not stated
Lens Types: silicone & fluorosilicone acrylates
Soft Lens Multipurpose Solutions
Soft Lens Multipurpose Solutions

Multipurpose solutions combine cleaning, rinsing and storage functions into one solution. Contact lens wearers use one product to take care of their day-to-day lens care needs. This provides convenience for the patient. Recently, “no-rub” formulations have been introduced to the market. This new breed appears to offer even more convenience, however, in order to provide adequate level of cleaning, they require extensive rinsing which takes more time and solution than the old “squirt and rub” method. Patients often need to be educated regarding this aspect of a “no-rub” system.

Multipurpose solutions contain preservatives to prevent microbial contamination and to disinfect the lenses during storage, buffers to maintain the solution's pH, and surfactants to clean the lenses. Other ingredients may include stabilizers, which prevent the degradation of the chemicals in the solution, and viscosity agents that increase the thickness of the solution.
Alcon No-Rub Opti-Free Express

Preservative(s): Polyquad 0.001%, Aldox 0.0005%, edetate disodium 0.05%
Buffer(s): sodium citrate, boric acid, sorbitol
Surfactant(s): Tetronic 1304, AMP-95
Viscosity: none
Stabilizer: none
Tonicity: isotonic
Alcon Opti-One Multipurpose Solution

Preservative(s): Polyquad 0.0011%, edetate disodium 0.05%
Buffer(s): sodium citrate, boric acid, mannitol
Surfactant(s): Tetronic, Pantionic
Viscosity: none
Stabilizer: none
Tonicity: isotonic
Allergan Complete Multipurpose Solution

Preservative(s): polyhexamethylenebiguanide 0.0001%, edetate disodium
Buffer(s): sodium phosphate
Surfactant(s): Poloxamer 237
Viscosity: hydropropyl methylcellulose
Stabilizer: none
Tonicity: isotonic
American Fare No-Rub Multipurpose Solution

Preservative(s): edetate disodium, polyaminopropyl biguanide 0.0001%, ethylene diamine

Buffer(s): sodium borate

Surfactant(s): polyoxyethylene polyoxypropylene block copolymer (Pluronic F127)

Viscosity: none

Stabilizer: hydroxylalkyl phosphonate

Tonicity: isotonic
Bausch & Lomb Renu Multiplus

Preservative(s): DYMED 0.0001%, edetate disodium
Buffer(s): boric acid, sodium borate, hydroxyalkylphosphonate
Surfactant(s): poloxamine
Viscosity: none
Stabilizer: none
Tonicity: isotonic
**Equate Multipurpose Solution No-Rub**

Preservative(s): edetate disodium, polyaminopropyl biguanide 0.0001%, ethylene diamine

Buffer(s): sodium borate, boric acid

Surfactant(s): polyoxyethylene polyoxypropylene block copolymer (Pluronic F127)

Viscosity: None

Stabilizer: hydroxylalkyl phosphonate

Tonicity: Isotonic
Home Best No-Rub Multipurpose Solution

Preservative(s): edetate disodium dihydrate 0.025%, polyhexanide 0.0001%
Buffer(s): bis-tris propane
Surfactant(s): polyoxyethylene polyoxypropylene block copolymer (Pluronic F127), cremophor RH40
Viscosity: cremophor RH40
Stabilizer: none
Tonicity: isotonic
Kirkland Signature Multipurpose Solution

Preservative(s): edetate disodium, polyaminopropylbiguanide 0.0001%
Buffer(s): tromethamine
Surfactant(s): Tyloxapol
Viscosity: none
Stabilizer: none
Tonicity: isotonic
CIBA Solo-Care Multipurpose Solution
Valu-Rite Multipurpose Solution

Preservative(s): edetate disodium dihydrate 0.025%, polyhexanide 0.0001%
Buffer(s): sodium phosphate (dibasic & monobasic)
Surfactant(s): polyoxyethylene-polyoxypropylene block copolymer (Pluronic F127)
Viscosity: none
Stabilizer: none
Tonicity: isotonic
Kroger Multipurpose Solution
Longs Multipurpose Solution
Perfect Choice Multipurpose Solution
Rite-Aid Multipurpose Solution
Safeway Multipurpose Solution
Sav-on Osco Multipurpose Solution
Target Multipurpose Solution
Top Care Multipurpose Solution
Walgreens Multipurpose Solution

Preservative(s): Polyquad 0.0011%, edetate disodium 0.05%
Buffer(s): sodium citrate, mannitol, boric acid
Surfactant(s): sodium lauroyl lactylate, poloxamine
Viscosity: none
Stabilizer: none
Tonicity: isotonic
Hydrogen Peroxide Systems
Hydrogen Peroxide Systems

Hydrogen peroxide lens care systems are among the most effective contact lens cleaning systems available. They use hydrogen peroxide as a disinfectant that must be neutralized (usually, but not always, by a platinum disc) into water and oxygen gas. Any rinsing done before lens insertion into the eye must be done with a separate saline or rinsing solution. Some systems include this rinsing solution and some do not.

The lenses must remain in the hydrogen peroxide for at least 6 hours in order for the peroxide to be fully neutralized. Contact of hydrogen peroxide to the eye results in irritation (indicated by the red tip).

In addition to the hydrogen peroxide disinfectant, these systems also include buffers to maintain the pH and stabilizers to keep the hydrogen peroxide from degrading in the bottle. Sometimes surfactants are used for cleaning purposes.
Allergan Ultracare Disinfecting Neutralizing Solution

Disinfectant: hydrogen peroxide 3%
Neutralizer(s): coated bovine catalase, cyanocobolamin (vitamin B12 color indicator)
Buffer(s): sodium phosphate
Surfactant(s): none
Stabilizer: sodium stannate, sodium mitrate
Viscosity: hydroxypropyl methylcellulose
Tonicity: not stated
CIBA AOSEPT Disinfection/Neutralization Solution

Disinfectant: hydrogen peroxide 3%
Neutralizer(s): platinum disc
Buffer(s): sodium phosphate
Surfactant(s): none
Stabilizer: phosphonic acid
Viscosity: none
Tonicity: isotonic

![Image of CIBA AOSEPT product]
CIBA Clear Care (AOSEPT) Cleaning & Disinfecting Solution (No-Rub)

Disinfectant: hydrogen peroxide 3%
Neutralizer(s): platinum disc
Buffer(s): sodium phosphate
Surfactant(s): Pluronic 17R4
Stabilizer: phosphonic acid
Viscosity: none
Tonicity: hypotonic
CIBA Pure Eyes System (Cleaner/Rinser & Disinfecting/Soaking Solutions)

Disinfectant: hydrogen peroxide 3%
Neutralizer(s): platinum disc
Buffer(s): boric acid, sodium borate, sodium perborate, sodium phosphate
Surfactant(s): Pluronic 17R4
Stabilizer: phosphonic acid
Viscosity: none
Tonicity: isotonic
Alcohol System
Alcohol System

Currently, Quickcare is the only alcohol-based lens care system on the market. Alcohol is used as the disinfectant and provides the fastest disinfection. This system is convenient for in-office cleaning of lenses that may become contaminated (i.e. dropped on the floor) or lenses that need to be stored (i.e., vial storage of contact lenses). The downside of this cleaning method is that the alcohol is extremely irritating to the eye and must be rinsed from the lens thoroughly.

Besides the alcohol disinfectant, the system contains buffers to maintain pH and a stabilizer to prevent solution degradation.
CIBA Quick Care System
(Starting & Finishing Solutions)

Disinfectant: generates hydrogen peroxide up to 0.006%
Buffer(s): sodium borate, boric acid, sodium perborate
Surfactant(s): isopropanol, polyoxypropylene polyoxyethylene block copolymer, disodium lauroamphodiacetate
Stabilizer: phosphonic acid
Tonicity: isotonic
Ultraviolet System
Ultraviolet System

To date, the only ultraviolet system available is the PuriLens system. Ultraviolet light is used to kill any microorganisms. A special container is required which provides the ultraviolet light. The storage solution is preservative free and contains buffers to maintain the solution's pH.
PuriLens System

Disinfectant: preservative free
Buffer(s): boric acid, sodium borate
Tonicity: isotonic
Gas Permeable Daily Cleaners
Gas Permeable Daily Cleaners

Daily cleaners for gas permeable lenses are used upon lens removal to remove any deposits and microorganisms accumulated during the day. In addition to the daily use of these cleaners, an enzymatic cleaner should be used periodically to remove long-term build-up. These products are not to be used in the eye (indicated by the red tip).

Daily cleaners generally contain an abrasive cleaner to buff away deposits, surfactants to help clean the lenses, and viscosity agents to help lubricate the lens for cleaning. Gas permeable cleaners can have preservatives or be preservative free. A few brands contain a tint to allow an easy check to see that all the cleaner is rinsed off at the end of cleaning.
**Resolve / GP Daily Cleaner** (Allergan)

Preservative(s): preservative free

Abrasive Cleaner: none

Viscosity: hexylene glycol, alkyl ether sulfate

Surfactant(s): cocoamphocarboxyglycinate, sodium lauryl sulfate, fatty acid amide

Tint: none

Tonicity: not stated

Lens Types: silicone acrylate copolymers
Boston Advance Cleaner (Polymer Tech)

Preservative(s): preservative free
Abrasive Cleaner: none
Viscosity: silica gel, alkyl ether sulfate
Surfactant(s): triquarternary cocoa-based phospholipid, ethoxylated alkyl phenol
Tint: titanium dioxide
Tonicity: not stated
Lens Types: silicone & fluorosilicone acrylates
Boston Original Cleaner (Polymer Tech)

Preservative(s): preservative free
Abrasive Cleaner: none
Viscosity: silica gel
Surfactant(s): alkyl ether sulfate
Tint: titanium dioxide
Tonicity: not stated
Lens Types: silicone & fluorosilicone acrylates
Lobob Sterile Cleaning Solution

Preservative(s): preservative free
Abrasive Cleaner: none
Viscosity: none
Surfactant(s): anionic detergents
Tint: none
Tonicity: not stated
Lens Types: all RGP materials
*no ingredients listed on product
Optimum Extra Strength Cleaner (Lobob)

Preservative(s): preservative free
Abrasive Cleaner: none
Viscosity: glycol
Surfactant(s): cocoamphodiacetate
Tint: none
Tonicity: not stated
Lens Types: silicone & fluorosilicone acrylates
Preservative(s): disodium edetate 0.1%, BAK 0.01%
Abrasive Cleaner: none
Viscosity: glycol
Surfactant(s): cocoamphodiacetate
Tint: none
Tonicity: not stated
Lens Types: all RGP materials
Preservative(s): edetate disodium 0.1%, Polyquad 0.001%
A abrasive Cleaner: polymeric cleaning beads
Viscosity: none
Surfactant(s): Tween 21 solubilizer (polyoxyethylene sorbitan monolaurate)
Tint: none
Tonicity: isotonic
Lens Types: all RGP & soft lenses
Gas Permeable Storage & Disinfectants
Gas Permeable Storage & Disinfecting Solutions

These solutions are for storing and disinfecting gas permeable lenses overnight. After cleaning the lenses with a daily cleaner, the lenses should be stored in these solutions for at least six hours. They can also be used to wet the lenses prior to insertion and are therefore safe for use in the eye.

Storage and disinfection solutions contain preservatives to prevent contamination and to disinfect the lenses during storage, buffers to maintain pH, and viscosity to enhance lubrication on insertion. Occasionally, a surfactant may be included for cleaning purposes,
Wet & Soak Plus (Allergan)

Preservative(s): BAK 0.003%, edetate disodium
Buffer(s): none
Viscosity: polyvinyl alcohol
Surfactant(s): none
Antioxidant: none
Tonicity: isotonic
Lens Types: silicone & fluorosilicone acrylates
Barnes-Hind Comfort Care Wetting & Soaking Solution
(Allergan)

Preservative(s): BAK0.004%, edetate disodium
Buffer(s): none
Viscosity: polyvinyl alcohol
Surfactant(s): none
Antioxidant: none
Tonicity: isotonic
Lens Types: silicone & fluorosilicone acrylates
Bausch & Lomb Wetting & Soaking Solution

Preservative(s): edetate disodium 0.05%, chlorhexidine gluconate 0.006%
Buffer(s): none
Viscosity: cationic cellulose derivative polymer
Surfactant(s): none
Antioxidant: none
Tonicity: not stated
Lens Types: silicone acrylates & Boston fluorosilicone acrylates
Boston Advance Conditioning Solution  
(Polymer Tech)

Preservative(s): chlorhexidine gluconate 0.003%, polyaminopropyl biguanide 0.0005%, edetate disodium 0.05%

Buffer(s): none

Viscosity: cationic cellulose derivative polymer, cellulosic viscosifier, polyvinyl alcohol, derivatized polyethylene glycol

Surfactant(s): none

Antioxidant: none

Tonicity: hypertonic

Lens Types: silicone & fluorosilicone acrylates
Boston Original Conditioning Solution
(Polymer Tech)

Preservative(s): chlorhexidine gluconate 0.006%, edetate disodium 0.05%
Buffer(s): none
Viscosity: polyethylene glycol, cellulosic viscosifier, cationic cellulose derivative polymer, polyvinyl alcohol
Surfactant(s): none
Antioxidant: none
Tonicity: hypertonic
Lens Types: silicone & fluorosilicone acrylates
Hard Contact Lens Sterile Soaking Solution (Lobob)

Preservative(s): BAK 0.01%, sodium edetate 0.25%
Buffer(s): none
Viscosity: none
Surfactant(s): none
Antioxidant: none
Tonicity: not stated
Lens Types: all RGP materials
Optimum Cleaning, Disinfecting, & Storage Solution (Lobob)

Preservative(s): benzyl alcohol 0.3%, disodium edetate 0.5%
Buffer(s): none
Viscosity: octylphenoxy polyethoxyethanol
Surfactant(s): lauryl salt of imidazoline
Antioxidant: none
Tonicity: not stated
Lens Types: silicone & fluorosilicone acrylates
Equate Contact Lens Conditioning Solution
Rite-Aid Contact Lens Conditioning Solution

Preservative(s): disodium edetate 0.1%, BAK 0.01%
Buffer(s): none
Viscosity: none
Surfactant(s): polyoxypolyethylene polyoxyethylene copolymer
Antioxidant: none
Tonicity: isotonic
Lens Types: all RGP materials
Kroger Rigid Gas Permeable Conditioning Solution
Perfect Choice Rigid Gas Permeable Conditioning Solution
Target Rigid Gas Permeable Conditioning Solution

Preservative(s): Polyquad 0.0011%, edetate disodium 0.1%
Buffer(s): boric acid, sodium borate
Viscosity: hydroxypropyl methylcellulose
Surfactant(s): none
Antioxidant: mannitol
Tonicity: not stated
Lens Types: all RGP materials
Gas Permeable Multipurpose Solutions
Gas Permeable Multipurpose Solutions

There are a few products on the market that are designed as an all-in-one care system for gas permeable lenses. They clean, disinfect, and store the lenses. The same methods are used for cleaning as with the traditional 2-step systems, but the same solution is utilized for everything. The solution is safe for use in the eye.

Gas permeable multipurpose solutions contain preservatives to prevent contamination and to disinfect the lenses, surfactants to clean the lenses, buffers to maintain the solution's pH, and viscosity agents to lubricate the lenses before insertion.
Unique pH Multipurpose Solution (Alcon)

Preservative(s): Polyquad 0.0011%, edetate disodium 0.01%
Buffer(s): boric acid
Viscosity: polyethylene glycol, propylene glycol, hydroxypropyl guar
Surfactant(s): Tetronic
Tonicity: not stated
Lens Types: silicone & fluorosilicone acrylates
Boston Simplicity Multi-Action Solution
(Polymer Tech)

Preservative(s): chlorohexidine gluconate 0.003%, polyaminopropyl biguanide 0.0005%, edetate disodium 0.05%

Buffer(s): none
Viscosity: silicone glycol copolymer, cellulosic viscosifier, derivatized polyethylene glycol
Surfactant(s): PEO sorbitan monolaurate, betaine surfactant
Tonicity: hypertonic
Lens Types: silicone & fluorosilicone acrylates
Rite-Aid Multi-Action Solution

Preservative(s): disodium edetate, polyhexanide 0.0001%
Buffer(s): sodium phosphate
Viscosity: none
Surfactant(s): Poloxamer
Tonicity: isotonic
Lens Types: silicone & fluorosilicone acrylates
## GENERIC BRAND NAMES LIST
(Pharmacy or Store that carries product)

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