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I. Introduction
There are a myriad of ophthalmic (eye drop) products, both prescription and nonprescription (over-the-counter), on the market in the U.S. A small percentage of people needing to use these ophthalmic solutions have a problem with the administration or installation of these solutions into their eyes. This product bulletin discusses eye-drop administration techniques and related difficulties and the pharmacists’ role in counseling patients in administration techniques with a focus on a new eye-drop administration accessory product called the Eyo® now available from Health Care Logistics.

II. Eye Disorders
The eye is one of the most sensitive areas of the human body and may be subject to many types of disorders.

Ocular disorders amenable to treatment with nonprescription products are:
• Tear insufficiency or dry eye
• Corneal edema
• Inflammation and irritation of the eye - presence of loose foreign material in the eye, irritation from airborne pollutants and chlorinated water, and allergic conjunctivitis
• Styes
• Inflammation of the eyelids

Conditions with physical causes (such as flash burns, lacerations, embedded foreign bodies and concussions) or conditions associated with specific disease states (along with uveitis; glaucoma; tear duct infections and corneal ulcers) should be referred to the physician immediately and are most likely treated with prescription medications.

Another common patient eye condition/problem where a physician should determine the underlying cause is decreased tear production which is usually associated with aging, physical trauma, and infection, or may be induced by antihistamines or anticholinergic drug products. Treatment here is with tear replacement utilizing artificial tear products.

III. Characteristics of an Eye Drop Solution
In general, both nonprescription and prescription ophthalmic products must be initially sterile and must have bacteriostatic additives to maintain sterility. These agents should be buffered, optically clear, and free from particles, filaments and fibers. In addition, they must not contain any extraneous excipients such as coloring agents or fragrance, and they should approximate the tonicity and pH of tears as nearly as possible.

Products of 0.9 ±0.2% sodium chloride equivalent may be considered isotonic and comparable to natural tears in tonicity. The eye tolerates 0.6 - 1.8% sodium chloride without damage.

Therapeutic agents contained in nonprescription ophthalmic products include antipruritics, anti-infectives, astringents, demulcents, emollients, decongestants and vasoconstrictors.

Although not a legal requirement, good pharmaceutical practice suggests that all ophthalmic products should have an expiration date and should be used or discarded within three months from the date of opening.

Microbial contamination is a serious problem with ophthalmic drops because the eye is such a sensitive organ. Consequently, the patient should be warned not to touch the tip of the dispenser and to keep the container tightly closed when not in use.

IV. Pharmacist Role in Eye Care
Pharmacists are often called upon to counsel patients experiencing ocular discomfort. The pharmacist is often the first health care professional to be contacted by a consumer with an eye problem. The decision to recommend self medication with a non-prescription product or a physician referral rests with the pharmacist. The pharmacist is also the last health care professional that a patient sees after visiting with their physician and receiving a prescription for an ophthalmic preparation.

Usually nonprescription ophthalmic preparations relieve only symptoms; they do not treat the disorder. The pharmacist should exercise good professional judgement when suggesting ophthalmic products for ocular disorders.

Nonprescription ophthalmic products are basically safe and effective only to relieve minor symptoms such as stinging, itching, tearing, tired eyes or eye strain. Ocular inflammation or discomfort may be caused by several conditions, including anatomical anomalies (such as incomplete closure of the eyelids); abnormal physiologic conditions (such as dry eye syndrome); allergic response; infection; and irritants.

An FDA advisory review panel recommends that "consumers should not self medicate for more than 72 hours without consulting a doctor". This FDA panel refers specifically to ophthalmic demulcent drugs, emollient and vasoconstrictor drug products. It is the pharmacist who advises a patient of this general rule when recommending nonprescription ophthalmic products.

As described above under eye disorders, conditions with physical causes or conditions associated with specific disease states should be immediately referred to a physician.
In both cases – over-the-counter use or prescription use, it is the pharmacists’ responsibility to counsel the patient in the correct administration technique for eye drops and to provide the patient with an eye drop accessory if the patient has difficulties in this administration.

V. Eye Drop Administration Techniques
The pharmacist should discuss proper installation technique with the patient to lessen the opportunity for contamination. The pharmacist should also stress appropriate storage techniques. The following are some general guidelines to provide to a patient who will self-administer eye drops.

Before administration, the hands should be washed and the product inspected for expiration date, contamination, discoloration, or other problems.

Ophthalmic drops should be administered to the patient with the head tilted back and up. The skin below the eye just above the cheekbone should be pulled down, and the fluid dropped into the lower conjunctival sac away from the tear ducts. To avoid contamination, the dropper tip should not touch the eye or lid.

Eye drops come in small bottles because they’re not meant for long-term use. The problem is that once the lid is taken off and the drops are used there’s always the chance of bacterial contamination. Eye drops usually contain preservatives that keep bacteria from multiplying, but once the bottle is open those preservatives begin to evaporate. When bacteria come in contact with the eye drops, they can multiply inside the bottle. When the drops are put in the eye, that can cause an infection.

If a patient complains of pain, discharge, or other signs of an infection, they should be instructed to see their doctor right away. The minimum a person will get is conjunctivitis, when the mucosal tissue over the white part of the eye gets inflamed and red and a discharge may develop from that.

While some of the problems could be serious, they’re not that common. But it is important that the patient be advised to throw the bottle out if it’s been opened for six months. It is also important to instruct the patient to never touch the tip of the bottle to their eyes when using the drops.

Some patients however, especially the elderly, have serious difficulties in self-administering eye medications. The literature is replete with reports of eye drop application problems from squeamishness of putting any foreign substance into the eye to missing the eye with the eye drops. While these problems may seem minor to most patients they can have far reaching consequences to those patients who have serious eye disorders that can only be remedied by eye drop application.

In some cases outside assistance may be required by patients who are unable to administer their own eye drops. The costs incurred in providing this assistance are high and completely out of proportion to a treatment that takes less than ten seconds.

Other eye drop administration problems include insufficient support for the eye drop bottle; poor positioning of the bottle; fear of touching the eye; nervousness especially first-time users; and difficulty squeezing the bottle. These problems are further amplified in elderly users in that they may have trembling hands; impaired vision especially when eyeglasses are removed; and inability to tilt the head back far enough or inability to lift the arm high enough. As a reaction to any of these problems, patients often become nervous and make matters worse by blinking their eyes. Worse case here is the drop never reaches the eye and is wasted. This can be a costly problem.

VI. Eyot Eye Drop Aid
The Eyot® is a newly designed accessory for users who need to apply eye drops not only smoothly and easily but also independently. Its ergonomic design offers the user, especially the elderly user, easy-to-handle eye drop application. The user applies the eye drops in a relaxed manner, knowing that each drop will fall exactly into the right position.

The Eyot® makes use of a special positioning system based on a magnifying mirrored surface and the actual dropper in the center. The user sees the whole application procedure. This mirrored surface reflects the eye and the user sees the dropper tip at the same time. The feature of the Eyot® is unique to the eye drop accessory field of products. No other product on the market can claim this advantage.

The Eyot® is available in two formats: 1) the white Eyot® – for users with clear vision with the convenient mirrored surface; 2) the red Eyot® – for users with very poor vision.

White Eyot®
For users with clear vision, the mirrored surface of the white Eyot® is most convenient. They can actually see their own eye reflected in the mirrored surface and the dropper tip at the same time. This makes it simple and easy for them to adjust the position of the dropper tip into exactly the right position. It allows the user to automatically adjust the Eyot® in such a way that the dropper tip is positioned in the conjunctiva area of the lower eyelid.
Red Eyot®
The ergonomic red-colored Eyot® is meant for people with very poor vision. The sharp contrast between the colored surface and the dropper tip makes it easier for them to position the Eyot®. The user sees a red surface and in it the white spot of the bottle's dropper tip. This allows the user to automatically adjust the Eyot® in such a way that the white spot is positioned in the center of the eye. This functions much the same way the white mirrored Eyot® does but works better for patients with very poor vision.

Eyot® is constructed from a thermoplastic resin material that resists any damage from the chemical working of the eye drop fluid. The material is relatively soft and pliable which means that it is also comfortable to use. The mirrored surface of the white Eyot® is made of a polyester based resin. Most eye drop containers are made of polypropylene, polyethylene or other materials that release the eye drops by squeezing the bottle, and can be used with the Eyot®. An estimated 95% of all bottles on the market are of these types.

Each Eyot® package contains both the white mirrored surfaced Eyot® and a red one.

Instructions for Use
The Eyot® is a well-designed eye dropper aid. It makes use of the eye's own function – sight – to aid in the administration of the eye drops. The Eyot® feels natural because users actually see what they are doing in the mirrored surface. When eyesight is poor, the red Eyot® is even more convenient.

1. Push the dropper into the hole at the back of the Eyot.
2. Place the lower space of the Eyot just under the lower eyelid and gently pull the lower lid downward.
3. With the white Eyot you will see a magnified reflection of your eye and the dropper tip at the same time. Tilt your head back while looking toward the ceiling through the gap between the mirror and the top spacer.
4. The head is now in position and you can squeeze the bottle to apply the drops. Gently squeeze drops into the eye.

1 White and 1 Red Eyot are included in this package.

White - mirrored surface allows viewing the eye for easier positioning of the dropper tip.
Red - is available for those with poor vision. The sharp contrast between the colored surface (no mirror) and the dropper tip allows the user to better position the Eyot.
VII. Summary
The attributes of a properly functioning eye drop administration aid are:
• Assists the user in correct positioning
• Offers enough support to prevent problems caused by trembling
• Provides full bottle access which makes it easier to squeeze
• Is hygienic - cannot be contaminated by make-up or tears
• Prevents actual eye or eyelid contact
• Is easy to attach and use
• Is economical
• Offers a user-friendly, non-threatening design

The Eyot® certainly meets all of these attributes and provides the uniqueness of two formats – one with a mirror for easy positioning and its alternative for patients with extremely poor eyesight. It allows the eye drop bottle to be placed at an angle so patients do not have to lift their arms high above their heads. It is most universal when it comes to fitting different brands of eye drop bottles. And most of all, it follows the accepted standard for eye drop application, which is into the conjunctiva area of the lower eyelid. This makes the Eyot® a good pharmacist recommended product.

Given the market size for ophthalmic eye drop products - both prescription and non-prescription; U.S. demographics and other supporting trends - there is an appreciable market for the Eyot®.

Though it is a highly targeted market in that only a small portion of people have problems self-administering eye-drops, it is a growing market due to demographics.