



Ophthalmology Update

Richmond Eye Associates, P.C.

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Ophthalmic Topics of Interest to the Medical Physician

Treating Common Ophthalmic Conditions

This issue discusses ophthalmic conditions and symptoms that might commonly be encountered by a medical physician.

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Chemical Eye Injuries:

Dangerous Chemicals Found Around the House

Many chemicals can be found around the house that are potentially damaging to the eye. Generally, in the case of any chemical injury to the eye, immediate irrigation with copious amounts of water **at the injury location** is of primary importance. Further irrigation in an Emergency Room, an Urgent Care facility, or by Rescue Squad can then follow. The eye should be subsequently examined by an ophthalmologist to determine the need for further treatment.

1. **Lye (sodium hydroxide)** is a widely available ingredient of homemade soap, and is also found as a drain cleaner. It is severely toxic to the eye, and can rapidly cause devastating and permanent damage. Immediate and copious irrigation is of most importance, and should continue until the tear pH is 7.0. Same day ophthalmic care is always mandatory.
2. **Drain Cleaners - Alkali** - these corrosive substances usually contain sodium hydroxide and / or potassium

hydroxide. These substances can cause severe burns to mouth, esophagus and stomach even when ingested in very small quantities, in addition to severe eye injuries. These substances are also present in various concentrations in products such as oven cleaners, toilet-bowl cleaners, automatic or hand dish-washing detergents, low-phosphate laundry detergents, bathroom and household cleaners, and hair relaxers.

3. **Ear Wax Remover (Ear Drops)** - unfortunately these can be mistaken for eye drops. Containing Carbamide

In spite of the large "EAR" on the bottle, people can inadvertently instill this ear wax remover as an eye drop.



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In the Next Issue of

Ophthalmology Update:

The Most Severe Ophthalmic Emergencies:

When Tomorrow is Too Late!

New Treatment Options for Dry Eye

Dry Eye is a common ophthalmic disorder, affecting 15% of individuals over age 65, and 6% of those over 40. New approaches are now being taken to treat this difficult disorder, which can cause symptoms of grittiness, foreign body sensation, burning, blurred vision, and even tearing (reflex tearing).

There are several contributing factors to the severity of symptoms, including:

- Coexisting blepharitis or allergic conjunctivitis.
- Medical conditions such as thyroid dysfunction, arthritis, and Sjogren's Syndrome.

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A Table of Ophthalmic Eye Medications for Itching

<u>Medication</u>	<u>Dosing</u>	<u>Mechanism of Action</u>	<u>Indications for Use</u>
Zaditor, Optivar, Alocril, Patanol, Elestat (new)	bid	Mast Cell stabilizer and Antihistamine	Treatment and prevention of symptoms of allergic conjunctivitis (especially seasonal)
Livostin, Emadine	qid	Antihistamine	Immediate treatment of symptoms of allergic conjunctivitis
Alamast, Alomide, Crolom	tid	Mast Cell stabilizer	Prevention of allergy symptoms and vernal conjunctivitis
Maxitrol, Tobradex, Dexacidin ointment	qhs (sparingly)	Antibiotic / anti-inflammatory ointment	Treatment of blepharitis along with eye lid cleaning / hygiene
Oral Doxycycline	bid	Antibiotic	Chronic prophylaxis of blepharitis or rosacea
Maxitrol, Tobradex, Dexacidin eye drops	qid	Antibiotic / anti-inflammatory eye drops	Prophylactic and symptomatic treatment of viral conjunctivitis
Alrex, Lotemax, FML	tid	Selective steroid (low risk of intraocular complications)	Treatment of symptoms of allergy, blepharitis, or dry eye
Artificial Tears (preservative free)	prn	Dilution of antigens	Treatment of symptoms of allergy and dry eye

Clinical Pearl: Distinguishing Causes of Ocular Itching

Itching of the eyes and eyelids is a common ophthalmic complaint, and rarely signifies a dangerous, vision threatening condition. Nevertheless, it can be extremely bothersome to some patients. It is useful to break the causes of itching down into four main categories:

- Allergy** - this can include environmental allergies as well as allergies to ophthalmic medications, especially preservatives. Typical findings of allergy include severe itching and diffuse injection of the conjunctiva and lids. Acute chemosis, or edema of the conjunctiva, is very specific for allergy. Discharge is usually mucoid or watery. There will often be an associated nasal or sinus disease. See treatment options in the table above.
- Eyelid or Skin Related** - blepharitis is an extremely common and often overlooked cause of itching. There may be no obvious findings with casual observation of the lids, except for redness of the lid margins and blockage of the meibomian glands at the margin. This is often associated with Acne Rosacea or Seborrheic Dermatitis. There is usually no significant discharge unless there is an acute infection or cellulitis.
- Viral Conjunctivitis** - viral conjunctivitis is common in adults, while bacterial conjunctivitis is more common in children. Symptoms include itching, watery discharge, redness, history of exposure to an infection person, preauricular adenopathy, and usually one eye infected followed by the other. Treatment is supportive with a prophylactic antibiotic and/or an anti-inflammatory eye drop. This can be highly contagious.
- Dry Eye** - dry eye is very common, and in some cases the irritation is perceived as itching. More commonly there are associated symptoms of grittiness, foreign body sensation, burning, and even tearing. A trial of preservative free artificial tears or ointment may be useful.

See the table above for treatment options for itching.

Causes of the “Foreign Body” Sensation

A “foreign body” sensation is the feeling that something is in the eye. While an actual foreign body may cause this, any breakdown of the cornea will lead to this sensation. A breakdown of the conjunctiva typically will **not** cause a significant foreign body sensation. Often patients describe a corneal abrasion like “a rock rolling around under the eyelid”. This is simply the eyelid itself crossing over the abrasion.

Common causes of a foreign body sensation that are readily diagnosed include:

- **A Corneal Foreign Body** - this can be extremely small, and is best visualized obliquely while shining a light on the cornea. Usually embedded metallic or rusted corneal foreign bodies **cannot** be easily removed with a swab.
- **A Foreign Body Trapped Beneath the Eyelid** - this leads to a superiorly located abrasion on the cornea. Everting the lid will reveal the foreign body. These often **can** be removed with a swab.
- **Corneal Abrasion** - diagnosed by observing the cornea with a Woods Lamp after instilling fluorescein, and is treated by patching the eye overnight with antibiotic ointment. Ragged edges may require debridement to heal.
- **Recurrent Corneal Erosion** - this is diagnosed by a typical patient history. This usually occurs upon awakening in the morning, with significant pain, tearing, and foreign body sensation, which often quickly resolves. In some cases the patient will wake up without opening the lids, and will slowly peel the eyelids open to prevent an erosion. This needs treatment by an ophthalmologist or corneal specialist.
- **Dry Eye** - this common disorder leads to diffuse breakdown of the cornea, which may **not** be visible under a Woods Lamp. This is treated with artificial tears, lubricating ointments, and other newer alternatives.
- **Blepharitis** - chronic inflammation or infection at the margin of the eyelid leads to a corneal erosion in a line where the lower lid touches the eye. Lid cleaning techniques and bedtime antibiotic ointment will treat this.
- **Ectropion of the Lower Eyelid** - if the lower lid sags away from the eye and is not touching the eye at all points, corneal breakdown will occur. Treatment is often surgical. Bell’s Palsy will greatly worsen this.
- **Entropion of the Lower Eyelid** - inturning of the eyelid will cause severe irritation of the cornea. This can often be seen by having the patient squeeze his eyes closed firmly. The lid will often then flip inward.
- **Trichiasis** - misdirected eyelashes are often very fine and are difficult to see without magnification.

Dangerous Household Chemicals (from page 1)

peroxide 6.5% and alcohol 6.5%, significant corneal injury can occur with accidental installation as an eye drop.

4. **Drain Cleaners - Acidic** - Some drain cleaners contain concentrated sulfuric acid which can cause immediate chemical burns to the cornea, conjunctiva, and eyelids. Unlike alkali burns, acidic burns tend to do immediate damage and then become neutralized. Nevertheless, immediate irrigation is required.
 5. **Alkaline Batteries** - This is a relatively unusual but significant cause of eye injury. **Case Report:** A 12 year old boy pried open an alkaline battery while at school with a screwdriver. The contents of the battery, which was a solid granular material, sprayed into both eyes, causing immediate pain. Minimal irrigation was done at the school, but instead was done by a rescue squad. When examined by an ophthalmologist, the corneal epithelium was severely damaged, and large sheets of conjunctiva were sloughing and had to be debrided. This case indicates the importance of immediate irrigation, and the special danger posed by solid material which may be retained inside the lids.
 6. **Wet Cement or Mortar** - is highly caustic. Contact with wet (unhardened) concrete, mortar, cement or cement mixtures can cause skin irritation, severe chemical burns, and serious eye injury. Immediate irrigation should be followed by examination to rule out retained material trapped inside of the eyelids.
 7. **Sodium Hypochlorite** - is the active ingredient found in household bleach, and **Sodium Percarbonate** is found in laundry cleaners such as OxiClean. These are alkali materials which cause irritation to the cornea and conjunctiva, and should be thoroughly irrigated from the eye. Nevertheless, these chemical are not nearly as damaging and toxic as Sodium Hydroxide.
 8. **Swimming Pool Chemicals** - should be handled with great care, with eye protection in place when dealing with concentrated chemicals. A wide variety of chemicals are used in both liquid and granular form, including chorine, chemicals to stabilize chlorine, chemicals to reduce algae, cleaners, and chemicals to adjust the pool pH. Cyanuric acid is used to lower the pH, and Sodium Hydroxide may be used to raise pH.
 9. **Cyanoacrylates** - include Super Glue and Crazy Glue, and are somewhat infamous for gluing eyelids together due to inadvertent contact. However, these glues do not bind to wet surfaces, so there is usually no actual eye injury. The lids themselves will separate as moisture and sweat built up on the skin. Usually on the eyelashes themselves will have to be cut to allow the lids to open.
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- Extensive patient information, including discussion of over 80 eye conditions and a section discussing risks and benefits of laser vision correction.
- Interactive Clinical Section concerning eye disease and physical findings
- Clinical Trials Database

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Ophthalmology Update
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New Treatment Options for Dry Eye (from page 1)

- Hormonal status, in women.
- Oral medications, such as antihistamines and diuretics.
- Tobacco use.
- External environment and humidity.

The following, relatively new medications target different aspects of the dry eye syndrome. This is much more complicated than simply using extra lubrication as needed.

Restasis (cyclosporine 0.05%)

Restasis is the first eye drop that actually increases tear production in patients with chronic dry eye syndrome caused by inflammation. Restasis blocks T-cell activated cell death in lacrimal gland tissue, but it can take from 1 to 3 months for its full benefit to be seen. It is especially useful in Sjogren's Syndrome, as well as in cases of keratoconjunctivitis sicca associated with rheumatoid arthritis, scleroderma, and lupus. It is used twice a day, with the only significant side effect being burning upon instillation.

Systane

Systane is an over the counter eye drop that contains a unique agent called HP-guar, which acts as a gelling agent upon instillation. Rather than replacing tears, Systane integrates with the tear film to decrease its evaporative time from the ocular surface. This promotes healing of the cor-

nea and conjunctiva. Usually used twice a day, this eye drop especially improves morning and end-of-day dryness.

Alrex and Lotemax

These eye drops are different concentrations of lotepred-nol etabonate, a selective steroid that treats the ocular surface rather than penetrating into the eye. Alrex is also a good lubricant, and has been shown to reduce the symptoms and severity of dry eye, without inducing steroid related complications (cataract and increased intraocular pressure).

Omega-3 Fatty Acids

Omega-3 fatty acids are found in over the counter supplements such as flaxseed oil, fish oil, TheraTears nutrition, and HydroEye. These orally taken medications help dry eye by suppressing inflammation at the margin of the eyelids (meibomianitis, also commonly seen in rosacea). They have also been found to stimulate tear production, and to improve the oil layer on the surface of the eye, preventing evaporation of tears.

Transiently Preserved Artificial Tears

Two lines of artificial tears, **Refresh** Tears and Liquigel, and **Gentle** Mild and Moderate are preferred artificial tears since they are functionally preservative free when placed in the eye. They show greater convenience as they are bottled, rather than being packaged in break off containers.