

Top Drops for Docs

By Joshua S. Gordon, OD

While technology continues to evolve, the diagnostic eye drops used to aid in thorough eye examinations and diagnosis have remained a constant. The following outlines those agents, their mechanism of action and how they are applied specifically to practice.

DIAGNOSTIC AGENTS

1 Proparacaine 0.5% ophthalmic solution (Alcaine, Ophthaine, Ophthalmic) is a rapid acting, topical anesthetic that induces anesthesia lasting approximately 10 to 20 minutes. It can be used during procedures such as gonioscopy, applanation tonometry and the removal of corneal and conjunctival foreign bodies.

2 Fluorescein sodium/benoxinate hydrochloride ophthalmic solution (Altafluor, Flurox) and fluorescein sodium/proparacaine hydrochloride ophthalmic solution (Fluorocaine, Flucaine) are indicated for procedures that require a staining agent with a rapid acting, short term anesthetic. These procedures include but are not limited to applanation tonometry, removal of corneal foreign bodies and short term relief of ocular pain while trying to evaluate the cornea in cases of ulcers and abrasions. These products are a convenient way of administering a dye and anesthetic in one drop.

3 Fluorescein sodium strips (BioGlo, Ful-Glo) are ophthalmic strips used for staining of the anterior segment when

disclosing corneal injury. They can also be used in evaluating rigid gas permeable contact lenses as well as measuring tear breakup time in cases of dry eye. While these strips are technically not an ophthalmic drop, they are essential in every day examination of the cornea and its components.

4 Phenylephrine ophthalmic solution 2.5% and 10% (Phenylephrine-Akorn, Phenylephrine Hydrochloride-Paragon BioTeck) is an Alpha-1 adrenergic receptor agonist indicated for the dilation of the pupil in adult and pediatric patients. It is the only topical sympathomimetic mydriatic agent on the market. After topical application, phenylephrine ophthalmic solution acts directly on the Alpha-1 adrenergic receptors in the eye by producing contraction of the dilator muscle of the pupil and contraction of the arterioles in the conjunctiva. It takes approximately 15 to 60 minutes to achieve maximum mydriasis and roughly three to five hours to recover. It can be used in combination with anticholinergic agents to further enhance pupil dilation.

5 Phenylephrine ophthalmic solution is also an excellent diagnostic drop that can be used to help differentiate conjunctival inflammation from deeper, episcleral inflammation. Superficial vessels will blanch or constrict more.

6 Phenylephrine 10% ophthalmic solution is relatively contraindicated

in patients with any preexisting cardiovascular disease or hyperthyroidism. It is also relatively contraindicated in children under five years of age and children with low body weight.

7 Tropicamide ophthalmic solution 0.5% and 1.0% (Mydracyl, Tropicacyl, Opticyl, Mydral, Ocu-Tropic) is an anticholinergic agent that blocks the responses of the sphincter muscle of the iris and ciliary muscle to cholinergic stimulation, thus causing pupillary dilation (mydriasis). The 1% solution also paralyzes accommodation (cycloplegia) while the 0.5% might cause slight cycloplegia. Mydriasis begins in 15 to 30 minutes and can last roughly three to five hours. The 1.0% solution is better indicated in patients with darker irides; while the 0.5% solution is quite efficient in achieving full mydriasis in those with lighter irides.

8 Cyclopentolate ophthalmic solution 0.5%, 1.0% and 2.0% (AK-Pentolate, Cyclogyl, Ocu-Pentolate) is an anticholinergic agent that has the same mechanism of action as tropicamide 1.0%, causing mydriasis and cycloplegia. The difference is in the time it takes to cause maximum cycloplegia (25 to 75 minutes) after installation and the time it takes to recover (six to 24 hours). In some patients, full recovery can take up to a week. Heavily pigmented irides may require more doses than lighter irides. Cyclopentolate ophthalmic solution is indi-



cated for refractions in children to control accommodation as well as pre-refractive surgery evaluations. It is also an excellent adjunctive drop for anterior uveitis. The cyclopentolate helps dilate the pupil to prevent the pain caused by spasm of the ciliary muscle.

9 Tropicamide 1.0% ophthalmic solution in combination with phenylephrine 2.5% ophthalmic solution is excellent when trying to achieve a wide dilation as well as in breaking synechiae in cases of anterior uveitis.

10 Sterile saline eye wash is not necessarily a diagnostic agent, however, I find that it is a very useful tool to have handy when using fluorescein sodium strips. I simply use a few drops to moisten the tip of the strip before applying the strip to the eye.

MAINTENANCE AND ADMINISTRATION

All of these diagnostic agents can be purchased from most of the major ophthalmic pharmaceutical distributors (see *Where to Find It*, at right). These companies will often run specials that make it more cost efficient to purchase larger quantities. The diagnostic agents can be stored in an eye-drop tray in the exam room, which can be purchased from the same distributors.

I administer these drops almost always unless we are prepping a patient for a procedure that requires corneal anesthesia or dilation before it is begun, in which my

technicians will administer the drops. On some occasions when a patient presents with a bad corneal ulcer or abrasion, I will have my technicians administer fluorescein sodium with anesthetic to provide the patient with comfort until I can examine them.

For most of my dilated fundus examinations, I use tropicamide 0.5%. I have found that it gives me an excellent dilated pupil while not paralyzing the patient's accommodation beyond normal function. The recovery time is also shorter. Many of my patients have to return to work, while others prefer the milder dilation when they are driving.

POST DILATION

Every patient who is dilated is walked out to the optical if they are purchasing glasses or escorted to the waiting room to relax while the dilation takes effect. This not only maximizes the patient's time by allowing them to look at glasses, it gives my technicians an open exam room to bring back another patient.

Not all patients can be dilated, so I make a note that the patient deferred the dilation, educate them on the importance of a thorough fundus examination, and then I reschedule them to return within four weeks. I perform an undilated fundus examination at that visit.

Lastly, before a patient leaves my office they are given a pair of post-mydriatic spectacles to wear—the type that wrap around and can be worn over the patient's

spectacles or by themselves. Even if patients bring their own sunglasses, I will often insist they take the post-mydriatic spectacles because they offer coverage of the periphery.

Just about every optometrist and ophthalmologist uses these diagnostic agents in some capacity. Some of these pharmaceuticals are available as generic drops and may be more economical than the brand name drops. Doctors may favor a particular brand or percentage over another, but the drops are being used for the same purpose. These essential diagnostic agents will allow you to provide a complete and thorough eye examination to every patient who walks in your door as well as assist you in diagnosing a large majority of ocular diseases and conditions. **OO**

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WHERE TO FIND IT:

Akorn Pharmaceuticals

800.932.5676 | Akorn.com

Eye Supply

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Henry Schein

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Sigma Pharmaceuticals

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