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# OTC Drops: Telling the Tears Apart

**When choosing an over-the-counter artificial tear for your dry-eye patient, consider severity of disease and form of dry eye.**

Artificial tears are a mainstay in the management of dry-eye symptoms, and there are numerous over-the-counter artificial tear products on the market today. Patients are often overwhelmed by the choices and do not understand the differences between them. When helping patients choose a tear, the most important considerations are the underlying cause of the dry eye and how often the patient is instilling drops.

“Self-selection of medications is not a good idea,” says John Sheppard, MD, professor of ophthalmology,

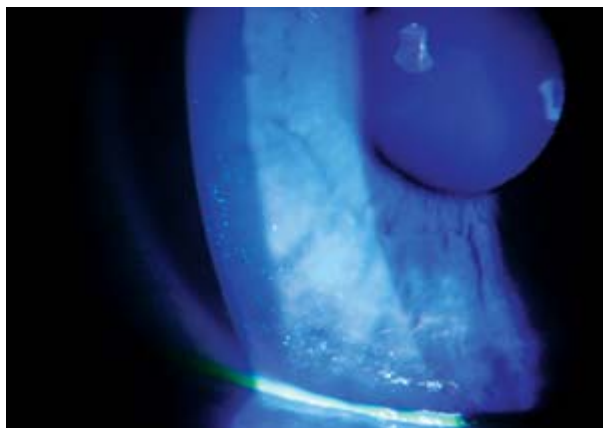
microbiology and molecular biology at Eastern Virginia Medical School. “Invariably, when patients bring in their drops, they will be the Wal-Mart or Safeway brand of tears, which are by far the most inferior tears on the market. Or, worse yet, they will use a topical vasoconstrictor like Visine, which induces vascular fragility, rebound vasodilation and dependence upon the vasoconstrictor to maintain a quiet, white-looking eye. Many times, patients will present using drops every 30 minutes or every hour, and this has a deleterious effect on lifestyle and well-being.”

When choosing an artificial tear for patients, experts generally consider three questions: Based on disease severity and dosing, is the optimum artificial tear for this patient preserved or not preserved? Does the patient have more of an aqueous deficiency, mixed disease or an evaporative form of dry eye? How severe is it?

### **Preservatives**

In recent years, there has been debate about whether the preservatives used in artificial tears are safe. While there are obvious advantages to the use of preservatives, several recent studies have highlighted the toxic effects of

benzalkonium chloride. For example, a recent study conducted at the University of Illinois at Chicago found that topical application of BAK to the eye causes corneal neurotoxicity, inflammation and reduced aqueous tear production.<sup>1</sup>



**Figure 1. Inferior superficial punctate keratopathy in mild dry eye. (Image courtesy John Sheppard, MD.)**

In this study on mouse eyes that were topically treated with vehicle or BAK (0.01% or 0.1%), BAK-treated corneas had significantly reduced nerve fiber density and aqueous tear production, and increased inflammatory cell infiltration and fluorescein staining. Changes were most significant after treatment with 0.1% BAK. Sequential *in vivo* imaging of corneas showed both reversible neurotoxicity characterized by axonopathy and recovery and irreversible neurotoxicity characterized by nerve degeneration and regeneration. Both doses of BAK reduced nerve fiber

length; however, the reduction was significantly more with the higher dose.

Fortunately, patients with severe dry eye or patients who are hypersensitive to preservatives now have excellent choices of a totally preservative-free drop, according to Dr. Sheppard. “There are good choices from a wide variety of manufacturers, and they come in a single-dose unit (SDU) with a twist-off cap,” he says. “In theory, you take one dose, and you dispose of it. Careful handling of the SDU will allow multiple uses because many are re-cappable, and as long as you don’t contaminate the tip by touching your fingers, eyelids or eyelashes, then it can be reused at least over the course of one day. However, I don’t recommend that practice to unreliable patients,” he says.

If a patient requires a preservative-free preparation, Dr. Sheppard notes that a few good choices are Refresh (Allergan), TheraTears, Soothe (Bausch + Lomb) and Systane (Alcon). “You can never go wrong with these. It’s just a little more expensive and a little more time-consuming to apply the drops,” he adds.

Another choice is formulations containing vanishing preservatives. The preservatives basically turn into water

or a non-toxic chemical when they are exposed to air or mix with the tear film. “The first vanishing preservative (sodium perchlorate) was introduced in the Genteal brand by Novartis, which is still available. Another brand of vanishing preservative is sodium chlorite or Purite from Allergan, which is found in a wide variety of their products, including all of their multi-dose preparations of the Refresh Optive brand of tears,” Dr. Sheppard explains.

Robert Latkany, MD, notes that cost can also play a role in artificial tear choice. “The preservative-free products can be double the cost of the preserved ones,” he says. “There have been studies showing that these preservatives are destroying the ocular surface, but I think it’s overstated and overhyped. If I can save some money for a particular patient and have him or her use Refresh Liquigel with a disappearing preservative rather than Refresh Celluvisc because they are using these products forever, numerous times a day, then I will take that into consideration. Many of these people see me every two to four weeks, so I can monitor the situation. If there is ever an issue with an artificial tear product, I pick up on it quickly,” says Dr. Latkany, founder of New York Eye and Ear Infirmary’s Dry Eye Clinic.

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