

# MASTERING TEAR SUPPLEMENTS

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The following steps should help you choose the best tear supplement and frequency of use for YOU:

## 1. Understand what “Dry Eye” means.

Unfortunately, the term “dry eye” is confusing, because it is often used to mean many different things.

The eye must be kept lubricated, both for the health of the eye and for the optics of the eye, so that the eye can see clearly. A deficiency in either tear quantity or tear quality can result in inadequate lubrication of the eye. High quantity tear production, as happens in emotional crying or when the eye is irritated or very dry, typically does not produce “good quality” lubricating tears.

There are three basic components of “high quality” lubricating tears: a mucin component, an aqueous or watery component, and an oil component. Inadequate quantity or quality of any of these three components will disrupt the lubricating effect of the tears and may even create “toxic tears,” tears which are irritating and inflammatory to the eye and eyelids.

All eye doctors are trained in recognizing and managing the different types of “dry eye,” but there are some professionals who specialize specifically in treating these problems. Regardless of the cause and individualized treatment, nearly all people with a “dry eye” or “tear film” problem benefit from some degree of tear supplementation. Which supplement is best for you and when you should use it probably is best determined by YOU!

## 2. Understand what is and what is NOT a tear supplement.

Tear supplements are supposed to lubricate the eye, nothing else. Over-the-counter drops that are advertised to “take the red out” are NOT tear supplements and should generally NOT be used without the explicit instruction of an eye doctor. A “red” eye is typically an inflamed or irritated eye, and the underlying cause needs to be determined and addressed. Shrinking the blood vessels on the surface of the eye will whiten the eye, but this does NOT treat the underlying pathology, and frequent, chronic use of such drops can contribute to vision loss.

With rare exceptions, prescription eye drops are NOT tear supplements. Restasis, most appropriate for a very specific type of “dry eye” problem, is a chemotherapy drug, not an eye lubricant.

An EYE RINSE or an EYE WASH is also not the same as a tear supplement and vice versa. Tear supplements are engineered to bind to the surface of the eye and are not the best choice to rinse away allergens, eye irritants, or even other thicker tear supplements that may have been used overnight. An eye rinse or eye wash is typically just saline solution available in bottles that are larger and cheaper than tear supplements.

People who have “posterior lid margin disease blepharitis,” also called “meibomitis,” “lid margin sebaceous hyperplasia,” or “ocular rosacea,” are often encouraged to apply warm compresses to their eyes to melt or thin the oil component of their natural tears. In the first few weeks of starting treatment, eye rinses or eye washes may be useful to rinse out the thick oil of their own tears BEFORE using a tear supplement.

### 3. Understand what is in a tear supplement.

There are four important characteristics of modern tear supplements that should be considered when choosing a supplement: the preservative, the type of gel, the amount of gel, and the presence of other “protective” factors.

- **Preservatives**

Preservatives prevent bacterial contamination once a supplement bottle has been opened. Reaction to a preservative is the most common reason why someone may have an allergy to or experience irritation from a supplement. Drops without preservatives are available, but preservative-free drops tend to be the more expensive and usually come in individual dispensing units, which may or may not be desirable. Common preservatives include:

|                       |                   |                        |
|-----------------------|-------------------|------------------------|
| Benzalkonium Chloride | Polyhexamethylene | Sodium Chlorite        |
| Biguanide             | Polyquad          | Sodium Silver Chloride |
| Chlorobutanol         | Polyquaternium    | Sodium Perborate       |
| Oxyborate compounds   | Purite            | Sorbic Acid            |

- **Gel Type**

The gel is the most important component of a tear supplement, because it is what allows the supplement to stay on the eye longer than just saline. Some people may find a particular gel is more comfortable for them than others. While other people may find that mixing supplements containing different gels provides the most benefit. Listed below are some of the more common tear supplements organized by the gel they contain. Note that some drops contain multiple gels already. Those marked with \* are ones our patients seem to like the most.

#### **Carboxy Methyl Cellulose (CMC) Based**

|                  |               |
|------------------|---------------|
| Refresh Liquigel | Refresh Tears |
| Refresh Optive*  | Thera Tears*  |

#### **Glycerin Based**

|                     |                    |                     |
|---------------------|--------------------|---------------------|
| Advanced Eye Relief | Refresh Optive*    | Soothe*             |
| Moisture Eyes       | Similasan Dry Eye* | Tears Natural Forte |

#### **Hydroxypropyl Methylcellulose (HPMC) Based**

|              |                  |                     |
|--------------|------------------|---------------------|
| Bion Tears*  | Genteal Mild     | Tears Natural Free  |
| Genteal      | Tears Natural II | Tears Natural Forte |
| Genteal Gel* |                  |                     |

#### **Oil Based**

|             |                |                      |
|-------------|----------------|----------------------|
| Retain MGD* | Refresh Endura | Soothe XP Emollient* |
|-------------|----------------|----------------------|

#### **Polyethylene Glycol Based**

|             |         |               |
|-------------|---------|---------------|
| Blink Tears | Systeme | Systeme Ultra |
|-------------|---------|---------------|

#### **Polyvinyl Alcohol Based**

- **Gel Concentration / Percentage**

The more gel present in the drop, the higher the percentage in the solution and the longer the supplement coats and protects the eye. But higher gel percentages increase temporary vision blurring. Mixing supplements of different gel percentages by sequentially placing different supplements in the eyes is an option, allowing the creation of unique gel percentages. For example, a 0.2% gel may be added after a 0.4% gel to create a situation that approximates 0.3% gel supplement, which will last longer than the 0.2% drop, but not blur the vision as much as the 0.4% lubricant.

Typically, a thinner drop might be chosen for use during the day, whereas a very thick drop or ointment could provide more benefit at night while sleeping.

Some of the thickest gels/ointments best for nighttime use include:

Genteal Gel

Lacri-lube ointment

Refresh PM ointment

Tears Again Night Gel

Tears Naturale PM

Duralube ointment

Puralube ointment

Even Vaseline may be used in people who have no reaction to petroleum jelly and do not mind the arduous eye rinsing in the morning. Vaseline comes in a tube. Placing this in a mug or glass of hot tap water for 20 seconds will typically make it quite runny.

- **Other Protective Factors**

Some supplements have additional ingredients which the manufacturers believe confer greater comfort and supplement stability. The comfort benefits of these added factors are mostly personal and not necessarily substantiated by study but are worth considering. Examples include:

Akwa Tears (hypo-osmolar salts)

Blink Tears (hyaluronic acid)

Optive (hyper-osmolar salts)

Systane Ultra (HP-guar)

Retaine MGD (poloxamer 188)

#### 4. Choose a Tear Supplement.

- One of the supplements marked with an \* above may be a reasonable first choice.
- If the drop causes itching or burning, the preservative is the most likely culprit and choosing a supplement containing a different preservative or no preservative at all (preservative-free) is a reasonable next step.
- If the tear supplement feels gritty, slimy, or leaves a “sticky residue,” choose a supplement with a different gel.
- If the tear supplement doesn't last very long, requiring very frequent application, then a drop with a higher percentage of gel should be tried.
- If the drop blurs the vision too much, then it is too thick, and consider a supplement with a lower percentage of gel or mix in a thinner gel. The higher the gel concentration, the longer the supplement lasts, but the more likely it is to cause blurry vision.

#### 5. Determine When and How Often to Use Tear Supplements.

- **Bedtime**

If the eyes are not dry or irritated in the middle of the night or upon awakening, a supplement at bedtime is probably not necessary. An eyedrop before going to bed likely has little use, as it

will not last very long. If a night-time supplement is needed, a thick gel is probably warranted. Avoiding sleeping directly under a ceiling fan or heating vent may be helpful.

- **Daytime**

Following a regular, timed schedule of supplement use is not as useful as situation-based application. For example, applying makeup, reading, working at the computer, watching TV or a movie, and driving require visual concentration and, in most people, decrease the natural blink rate by at least 3-fold. Since a blink acts as a “reverse windshield wiper” smearing tears across the eye, decreased blinking means decreased eye lubrication, and using tear supplements before and during such activities is often helpful.

Any factor that increases natural tear evaporation (i.e. a brisk wind, cold weather, indoor heating, diminished blinking) will require more frequent tear supplementation.

Once the eyes have dried out, tear supplementation is less effective at providing comfort. So, identifying drying factors and using the tear supplements BEFORE exposure to such drying influences is more effective in keeping the eyes safe and comfortable.

Eyes are not smart. They can't tell the difference between a dry eye / tear film problem and a stick or eyelash in the eye. The response to all eye irritation is often to make copious amounts of “water tears.” These are “washing tears,” not “lubricating tears.” Thus, excessive tearing may be due to the eyes being “dry.” Learning what things make your eyes water may be the same as learning what things make your eyes dry and using tear supplements BEFORE entering such situations may diminish excess tearing. Common “dry eye” symptoms include burning, gritty feeling, eyelid heaviness, and eye fatigue, although these may be absent, and the only clue might be excessive tearing.

To avoid prolonged blurring of both eyes simultaneously, supplements of different thickness/percentage may be used in the two eyes. For example, a 0.2% solution can be used in one eye while a 0.3% solution is used in the other and then reversed a couple of hours later. Or the same supplement may be applied to both eyes at different times. Finally, supplements of different gel concentrations may be combined by rapid sequential instillation to create unique gel concentrations.

Remember, tear supplements may be used as often as desired, and for some people, slow, frequent blinking may be just as effective as the use of tear supplements.

An excellent reference for determining the composition of many additional tear supplements not covered here is the following link: <http://www.dryeyezone.com/encyclopedia/lubricants.html>

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