

# Fact Sheet: Artificial Tear Ingredients

Artificial tears (ATs) are a large component of dry eye treatment. When our natural tears are deficient or evaporate quickly, supplementation with various artificial tears is necessary. How do you recommend ATs to patients based on their dry eye complaints and presentations? Here is a reference to help!

## Aqueous Deficient Dry Eye

Look for viscosity enhancing agents – Examples Include:

- Carboxymethyl cellulose • Dextran • Hyaluronic acid or sodium hyaluronate • Hydroxypropyl-guar (HP-guar) • Hydroxypropyl methylcellulose (HPMC) • Polyvinyl alcohol (PVA) • Polyvinylpyrrolidone (PVP) • Polyethylene glycol

## Evaporative Dry Eye

Look for formulations containing lipids and surfactants – Examples Include:

- Phospholipids • Fatty acids • Triglycerides • Mineral oil, castor oil, olive oil, coconut oil, soybean oil, and flaxseed oil • Cetalkonium chloride (CKC) • Dimyristoyl-phosphatidylglycerol • Octoxynol 40 • Polysorbate 80 • Polyoxyl 40 stearate • Tyloxapol • Poloxamer 188



## Beyond Lubrication – Examples of Important Ingredients

| Buffers   | Electrolytes   | Osmoprotectants  | Anti-oxidants   |
|---|--|--|---|
| Maintain stable pH  | Maintain osmotic pressure  | Protect against osmotic and oxidative stress                         |   |
| Citrate, phosphate and borate buffers • Sodium borate, aka sodium tetraborate or disodium tetraborate, can also act as a crosslinking agent that binds to HP-Guar | Sodium chloride • Potassium chloride • Calcium chloride • Magnesium chloride • Zinc chloride • Sodium borate • Sodium phosphate • Boric acid | L-carnitine • Erythritol • Betaine • Sorbitol • Glycerin • Trehalose | Vitamin A • Vitamin B6 and B12 • Vitamin E • Co-enzyme q10 • Lipoic acid • Erythritol • Trehalose |

## Preservative vs Preservative Free

Benzalkonium chloride (BAK) is the most frequently used preservative in eye drops. Other preservatives include polyquaternium-1 (PQ, POLYQUAD®), sodium chlorite (PURITE® or OcuPURE®), edetate disodium (EDTA), which are less harsh than BAK. Try to recommend preservative-free ATs whenever possible, or at least those with softer preservatives