Ophthalmic drops with soft and gas permeable contacts – on or off?

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There are times when our contact lens patients require topical ophthalmic drops. Infections, inflammation, ocular surface diseases, allergies and glaucoma are all instances where we have to advise our patients on proper drop instillation with respect to their contact lens wear.

The primary concern with using topical drops while wearing contact lenses is the absorption of the drug or its preservative into the matrix of the lens. Drug uptake and subsequent slow release can lead to over exposure of a drug. Excessive drug effects, corneal toxicity reactions, epithelial damage, optical quality damage and discoloration of the lens can all occur. Pupillary dilation, limbal hyperemia, rebound hyperemia, intraocular lens pressure (IOP) spikes and angle closures are just some possible drug overdose effects.

Gas permeable (GP) contact lenses absorb little to no medication or preservative. The fit and size of a lens will determine if any negative outcomes will arise. A GP lens can prevent a drug from reaching the cornea and, conversely, if too much of the drug collects and becomes trapped under the lens it can cause a toxic corneal reaction.

Soft contact lenses, on the other hand, absorb water soluble molecules quite easily. Any molecule smaller than 500g/ml will quickly be absorbed. The higher the water content of a lens, the more it will absorb. Lens thickness, drug concentration and exposure time will all affect absorption rates as well.

All topical drops, according to Food and Drug Administration (FDA) guidelines, require the removal of contact lenses prior to drop instillation with the exception of some lubricants. The length of time to wait before re-insertion varies from 10 to 15 minutes. Studies have shown that the majority of a drug clears from the surface of the eye during the first five minutes after instillation. Keeping the lenses removed for 10 minutes was found to prevent significant absorption, but waiting only five minutes was sufficient to reduce absorption to a level that would not cause any physiological responses.

All preservatives are toxic. Benzalkonium chloride (BAK) is a very commonly studied preservative. BAK in concentrations higher than 0.02 percent disrupt the cornea within seconds. It has been shown to have a high absorption rate in soft lenses and very little in GPs. The rate of release from GPs is very quick and much slower for soft lenses. If removing a lens may prevent proper healing of the cornea or may risk further damage, keeping the lens on during drop instillation is recommended. We all do this on a regular basis when we use a bandage lens for corneal abrasions. On the other hand, when wearing a contact lens would exacerbate a condition, such as an infection, removal of the lenses is recommended. Our contact lens patients never want to give up their lenses, and convenience is a high priority for them. Finding the right routine that will be safe and allow compliance is our responsibility. The properties of a drug and the contact lens to be used will all factor into your decision-making process. If unsure, the most prudent strategy is to follow the FDA guidelines; however, deviating from the guidelines can be safe as long as good clinical judgment is used and followup care is made a priority.
References:

7. Silbert, J. Medications and Contact Lens Wear - The complex association between contact lenses and the effects of medications can influence successful contact lens wear. Contact lens spectrum. May 5th 2002

Dr. Pal received her Doctor of Optometry degree from the Southern California College of Optometry. She completed her Contact Lens and Cornea residency at Northeastern State University Oklahoma College of Optometry where she is certified in therapeutic pharmaceutical agents, glaucoma and anterior segment lasers. Dr. Pal has a contact lens specialty practice in Toronto, Canada. She is an adjunct faculty at the University of Waterloo and a facilitator and coordinator of industry contact lens workshops at optometry schools throughout North America.

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