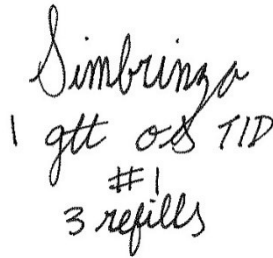


## Technician Tutorial: The Ins and Outs of Eye and Ear Meds

Eye (ophthalmic) drops and ear (otic) drops have a wide variety of uses. For example, there are prescription (Rx) eye drops for things like treating infections and managing glaucoma. Over-the-counter (OTC) eye drops are available to relieve discomfort, such as dryness and itching of the eyes. Rx ear drops are commonly used to treat ear infections, and OTC ear drops are often sought out to remove excess earwax.

To prevent mix-ups and misuse, there are some special considerations to keep in mind when filling prescriptions for ear and eye meds, and when helping patients who ask about OTC ear or eye products. This tutorial covers important information, such as relevant abbreviations, storage, and dispensing tips.



Simbrinza  
1 gtt OS TID  
#1  
3 refills

*John is a 67-year-old patient who brings in a prescription for Simbrinza for glaucoma. He tells you he would like to wait for the prescription. You confirm that there have been no changes to his address, phone number, drug allergies, or insurance information.*

### ***What's the difference between ear and eye drops?***

A big difference between ear and eye drops is that eye drops must be sterile. Some ear drops are sterile (e.g., *Ciprodex*), but some are not (e.g., *Cipro HC [US]*). In addition, ear drops may be acidic.

Because of these differences, eye drops can generally be used in the ears, but **ear drops should never be used in the eyes**. Eye tissue is much more sensitive than ear tissue, and ear drops can be irritating to the eyes. There are reports of errors where ear drops have been administered into patients' eyes. Putting these products in the eyes can cause redness and swelling of the eyes and blurred vision. Flushing the eyes with water or saline, and a visit to the emergency department or ophthalmology clinic might be required.

Prescribers might write prescriptions for eye drops to be used in the ears in some cases, and this is generally okay. Some eye drops may be less expensive for the patient, or the ear drop containing the same ingredient may not be available due to a shortage. But eye drops can't usually be automatically substituted for ear drops, even if the active ingredient looks the same.

### ***How can I prevent errors when entering prescriptions for ear or eye meds?***

**Abbreviations.** Be alert for the Latin abbreviations sometimes used on prescriptions for eye and ear drops:

**AD:** right ear  
**AS:** left ear  
**AU:** both ears

**OD:** right eye  
**OS:** left eye  
**OU:** both eyes

**GTT/GTTS:** drop/drops

To help keep “A” versus “O” straight, remember “A” for audio or auditory, which relates to hearing. And remember “O” for ocular, optometry, or ophthalmology, all which relate to the eye. The “D” in “AD” or “OD” stands for “dextro,” which means right. The “S” in “AS” or “OS” stands for sinister, which means left in Latin. This leaves the “U” in “AU” or “OU” to stand for both.

The use of these abbreviations can increase the risk for errors, since they can be mistaken for each other (“AD” can be taken to mean right eye, “OD” can be taken to mean right ear, etc). For instance, a handwritten letter “A” can look like the letter “O” in some cases. In addition, “OD” can be easily mistaken for the “once daily” abbreviation, “QD.” Because of this potential for confusion, the Institute for Safe Medication Practices (ISMP) recommends against the use of these abbreviations. Instead, “right ear,” “left ear,” “right eye,” “left eye,” etc, should be spelled out.

An unusual abbreviation that might lead to confusion is “**per os**.” This means “by mouth” and is commonly abbreviated as “PO.” When “per os” is written out, it could be mistaken as “OS” for “left eye.” The use of “per os” is not recommended.

If you encounter these abbreviations, be sure to alert the pharmacist for clarification. Dangerous abbreviations are especially concerning because the confusion is often not obvious. Keep these abbreviations and the potential for confusion in mind when you are filling prescriptions for ear or eye drops. Refer to ISMP’s list of error-prone abbreviations if needed: <https://www.ismp.org/recommendations/error-prone-abbreviations-list>.

It’s also important to note that the words “**optic**” (referring to the eye) and “**otic**” (referring to the ear) can be confused for one another. For example, an Rx that says ofloxacin otic solution could be misread as ofloxacin optic solution and interpreted as being for use in the eye. Keep in mind that the word “optic” will rarely be used on prescriptions. Otic, however, is frequently used as part of the drug name of ear drop products. If you forget whether “**otic**” means ears or eyes, try to remember that it matches the first three letters of “**otitis media**,” which is the medical term for an **ear** infection.

*You see that John’s prescription for Simbrinza is written using potentially confusing abbreviations. You are pretty sure the prescription says OS, which you know means left eye, but the more you look at the Rx, the more you think it could also say OD. To double-check, you ask John which eye is affected, and he tells you the right eye. This is different than what you initially thought the prescription said, so you look for more information by scanning John’s medication list. You see that he has an Rx for brinzolamide eye drops, which is also for glaucoma. The instructions say to use this medication in the right eye. Still, you don’t want to make any assumptions, so you take this information to the pharmacist who calls the prescriber for clarification.*

**Dosage forms.** Clarify Rxs that don’t specify a dosage form. For example, using the *Cortisporin* (US) ear drop **solution** containing hydrocortisone, neomycin, and polymyxin B instead of the *Cortisporin* (US) ear drop **suspension** containing the same ingredients in an irritated ear can cause burning since the ear drop solution is more acidic. Plus, the suspension is thicker than the solution, which could be a problem if the inside of the ear is very swollen. Also, don’t automatically substitute between suspensions and solutions. These aren’t the same, even though they have the same active ingredients. As previously mentioned, don’t be surprised to see some **eye** drops (ciprofloxacin, ofloxacin, etc) used in the ear for ear infections. This is generally okay, but it’s **never** okay to use ear drops in the eye. Check with the pharmacist if you get a prescription for ear drops with instructions to use them in the eye.

**Look-alike/sound-alike meds.** Prevent mix-ups with look-alike/sound-alike drug names such as *Ciprodex*, *Cipro HC*, *Cortisporin*, etc. Dispensing non-sterile *Cipro HC* instead of sterile *Ciprodex* can be risky in some cases, such as in patients with a ruptured eardrum. Be careful with generic names that look or sound the same as well. For instance, in the US, *Cortisporin* comes in an ophthalmic and otic suspension that are available as generics with the same exact ingredient combo: hydrocortisone, neomycin, and polymyxin B. When pulling

these meds off the shelf, look for product packaging to have an ear or eye symbol and/or to specify “For Use In Ears Only,” “For Ophthalmic Use Only,” or other similar wording to indicate that the product matches the intended route of administration. To prevent mix-ups between ear and eye drops, it’s a good idea to store these products in separate places in the pharmacy. If this isn’t possible, shelf tags can be used to highlight the different routes of administration. Always use barcode scanning to confirm you’ve selected the right product from the shelf.

**Alerts.** Watch for drug interaction alerts with beta-blocker eye drops, such as timolol (*Timoptic*, etc) or levobunolol (*Betagan* [US]). Administration into the eye can result in significant blood levels of these blood pressure-lowering drugs. For example, one drop of timolol 0.5% in each eye has a similar effect as 10 mg of oral timolol. This could cause problems for patients taking oral beta-blockers (atenolol, metoprolol, etc) or some other blood pressure-lowering med (amlodipine, nifedipine, etc). Also watch for unintended duplicate therapy alerts with combination meds, such as *Cosopt* (dorzolamide and timolol), *Simbrinza* (brimonidine and brinzolamide), or *Combigan* (brimonidine and timolol). Be sure to talk to the pharmacist about cancelling out old Rx’s in the computer for single ingredient drops when your patient switches to a new combo. For example, cancelling old timolol or dorzolamide eye drop Rx’s when a patient starts *Cosopt* can help prevent the discontinued med from being accidentally refilled.

*The pharmacist verifies with the prescriber, and documents on the Rx, that the directions should be to “Instill 1 drop into the right eye three times a day.” The pharmacist also lets you know that the prescriber is discontinuing the brinzolamide eye drops, and that Simbrinza is replacing it. This makes sense, since Simbrinza is a combination product containing brinzolamide and brimonidine.*

### ***How do you calculate days’ supply with ear or eye drops?***

Ear and eye drop Rx’s are often targets of pharmacy insurance audits. Don’t automatically override rejects, such as “exceeds max dose/day,” “plan limitation exceeded,” or similar messages. These are often signs that something is amiss. Call the payer for clarification. In some cases, they will want you to use the manufacturer’s recommended drops per mL for your calculation, or a smaller pack size if one is available.

To determine the days’ supply, use the following steps:

#### **1. Determine the total number of drops needed per day.**

# of drops per eye (or ear) x number of affected eyes (or ears) x number of times per day = total drops needed per day

*For John’s prescription, he will be using 1 drop per eye x 1 affected eye x 3 times per day = 3 drops per day (in Canada, Simbrinza product labeling recommends twice a day dosing).*

#### **2. Determine how many drops are in the bottle.**

# of mL x  $\frac{\text{\# of drops}}{\text{mL}}$  = # of drops

A commonly used conversion for drops to mL is 20 drops/mL; however, keep in mind that drop size can vary depending on the dropper, ingredients, formulations, and other factors. Because of this, some insurance companies or employers might specify different conversions, such as 15 drops/mL. Or they may outline different conversions depending on the dosage form, such as 20 drops/mL for solutions and 15 drops/mL for suspensions. The product’s package insert (product monograph in Canada) may also include information on drops/mL.

Double-check with the pharmacist to find out which conversion to use if you aren't sure. Contact the insurer or check the product information for guidance if your pharmacy doesn't have a set policy. This can help prevent billing issues and audit flags.

*For John's prescription, Simbrinza is available in an 8 mL bottle (10 mL in Canada). The pharmacist advises you to use 15 drops per mL since Simbrinza is a suspension.*

$$8 \text{ mL} \times \frac{15 \text{ drops}}{\text{mL}} = 120 \text{ drops in an 8 mL bottle}$$

**3. Determine the days' supply by dividing # of drops in the bottle by total number of drops needed per day.**

$$\frac{\text{\# of drops per bottle}}{\text{\# of drops per day}} = \text{days' supply}$$

*Since John will be using 3 drops per day:*

$$\frac{120 \text{ drops per bottle}}{3 \text{ drops per day}} = 40 \text{ days' supply}$$

Use our technician tutorial, *Calculating Days' Supply*, for more guidance on how to correctly calculate days' supplies.

Keep in mind that ear and eye drops aren't only available in multidose bottles. For example, some eye drops, like *Restasis* (cyclosporine), *Xiidra* (lifitegrast), and *Zioptan* (tafluprost; US), come in single-use, individual unit dose containers (may also be referred to as "vials" or "pipettes"). In this case, each single-use container can be used to administer a drop in one or both eyes, depending on the prescription instructions. After the prescribed dose is given, the single-use container must be immediately discarded; it can't be saved to administer doses later in the day or on following days. So a carton of 30 single-use containers will last a patient 15 days if the patient uses one drop in each eye twice a day (1 single-use container will be used to give one drop in each eye and will then be immediately discarded; therefore, two single-use containers must be used each day for twice a day dosing; 30 single-use containers/2 single-use containers per day = 15 days' supply).

***What should I keep in mind when labeling ear or eye med prescriptions?***

Ear drops should bear the auxiliary label "For the ear." Eye drops should bear the auxiliary label "For the eye" **unless** they are prescribed for use in the ear, in which case it's really important for them to have the label "For the ear." Ear or eye drops that come in a suspension dosage form must be shaken prior to use so that the drug particles are evenly distributed throughout the liquid. Include a "Shake well" label on suspensions. Depending on storage requirements for ear or eye drops, they may also require "Use by" or "Refrigerate" auxiliary labels. More details on this will be discussed in the next section.

Eye gels or ointments may cause blurry vision right after applying, so it's best to avoid driving while, or immediately after, applying these. Apply a "May impair ability to drive" label to these products, as well as to pilocarpine eye drop Rx's (*Vuity* [US], *Isopto Carpine* [Canada], etc). Although pilocarpine comes in an eye drop solution and not an eye gel or ointment, it may reduce night vision and limit night driving ability.

Remember when you are affixing any type of label to ear or eye drops to never cover the expiration date. Since these bottles and/or boxes can be quite small, you may need to "butterfly" the label (fold it in half and attach the ends to the package). Check with your pharmacist if you are unsure of the preferred method in your pharmacy. Always make sure the product you are dispensing is not expired before labeling it.

Note that in the hospital setting, ear and eye drops should always be labeled with the patient's name when they are dispensed. These products should never be used for more than one patient. If possible, place the label on the med bottle, rather than on a box or plastic baggie, in case the outer covering is discarded. This will help prevent confusion about which patient these meds were dispensed for.

***Do ear or eye drops ever require special storage?***

Most ear and eye drops can be stored at room temperature. However, there are a few eye drops that do require refrigeration. For instance, you'll need to store *Azasite* (azithromycin [US]), *Xalatan* (latanoprost), and *Zioptan* (tafluprost [US]) in the refrigerator. Remember this when you are locating the product in the pharmacy and when putting away inventory. Fortunately, patients can store most of these products at room temperature for a number of days once in use. Examples of these beyond-use dates include 14 days for *Azasite*, 30 days for *Zioptan*, and 42 days (6 weeks) for *Xalatan*.

Although not commonly dispensed, it's worth pointing out that *Alcaine* (proparacaine) eye drops need to be refrigerated both in the pharmacy and after dispensing the product while it's in use. Make sure to affix a "Refrigerate" auxiliary label if you dispense proparacaine eye drops.

Advise patients to store ear or eye med bottles in their original carton and to keep them separate from other products or substances in drop bottles. For example, there are cases of patients mistaking bottles of super glue for eye drops and gluing their eyelids shut.

*Since you know that Simbrinza is an eye drop, you go to the shelf that contains all of the eye drops. You select the correct product by double-checking the NDC (DIN in Canada) number on the package against the prescription label and by scanning the product's barcode. Before applying the prescription label, you check the expiration date on the product and see that it is good for another two years. You attach the prescription label according to your pharmacy's policy, making sure not to cover the expiration date or any other important information. You also attach a "Shake well" auxiliary label, since Simbrinza is a suspension, and a "For the eye" auxiliary label.*

***What should I keep in mind about OTC ear or eye meds?***

You may see patients buying OTC ear or eye meds for a variety of uses, such as earwax removal, swimmer's ear, dry eye, or allergies.

Help patients avoid confusion with OTC eye drops, since many products look alike and have similar names, but contain different ingredients. For example, *Visine Dry Eye Relief* (*Visine Tired Eye Relief* in Canada) is a lubricant that can help relieve dry eyes. However, *Visine Red Eye Comfort* (*Visine Red Eye Original* in Canada) is a decongestant, used to relieve redness. Using *Visine Red Eye Comfort* for dry eyes instead of a lubricant could lead to more eye irritation.

Point out administration instructions on product labeling. For example, lubricant gels and ointments for dry eye may be used when lubricant drops aren't enough. However, as previously mentioned, eye gels or ointments should usually be used at bedtime, since they may blur a person's vision.

Watch for patients getting multiple OTC or Rx eye drops and refer them to the pharmacist. The order of administration is important for medication absorption. For example, for optimal absorption, patients should generally instill eye solutions first, then suspensions or gel-forming drops, and then eye ointments. This is because thicker meds may prevent absorption of thinner ones. It's best for patients to wait at least five minutes, or longer if specified by the product, before applying another drop or a different product in the same eye. This helps prevent the first drop from being washed away by the second.

Contact lens wearers should be careful when selecting eye drops. Rewetting agents (*Renu*, etc) work similarly to lubricants for dry eye, but are designed for contact lens wearers. Using eye drops that aren't designed for use with contacts can lead to eye irritation or damage to the contact lenses. Ask patients purchasing OTC eye drops or picking up Rx eye drops if they wear contact lenses. If so, they may need to change the product they have selected or get additional instructions from the pharmacist. For example, many products will require contact lenses to be removed before administration and not be reinserted until 15 minutes have passed.

Stay alert for patients looking for ear candles or ear vacuums (*WaxVac*, etc) to help remove earwax. There's no evidence these draw out wax, and ear candles can cause burns. And refer patients who want to purchase OTC ear drops for swimmer's ear to the pharmacist. This condition is best treated with Rx ear drops; OTC ear drops may mask progression or be unlikely to help.

*Cite this document as follows: Technician Tutorial, The Ins and Outs of Eye and Ear Meds. Pharmacist's Letter/Pharmacy Technician's Letter. February 2023. [390280]*

***--Continue to the next section for a "Cheat Sheet" for Eye and Ear Med--***

## “Cheat Sheet” for Ear and Eye Meds

### *What’s the difference between ear and eye drops?*

- Sterility
  - Eye drops **must** be sterile.
  - Ear drops may or may not be sterile.
- Acidity
  - Ear drops may be acidic.
- Use
  - Eye drops **can generally** be used in the ears.
  - Ear drops **should never** be used in the eyes.

### *Which abbreviations should I look out for on Rx’s for ear or eye meds?*

**AD:** right ear – think **D**extro means right, to remember **D** refers to right

**AS:** left ear – think **S**inister means left, to remember **S** refers to left

**AU:** both ears

\*Think **A**udio to remember **A** refers to e**A**rs\*

**OD:** right eye – think **D**extro means right, to remember **D** refers to right

**OS:** left eye – think **S**inister means left, to remember **S** refers to left

**OU:** both eyes

\*Think **O**ptomety to remember **O** refers to eyes\*

**GTT/GTTS:** drop/drops

### *What should I keep in mind when calculating days’ supply of ear or eye drops?*

- Ear and eye drop Rx’s are often targets of pharmacy insurance audits.
  - Don’t automatically override quantity or days’ supply rejects; call the payer for clarification.
- Use a drops/mL conversion as determined by:
  - pharmacy policy.
  - package insert or product monograph.
  - insurer preference.
  - dosage form (e.g., 20 drops/mL for solutions, 15 drops/mL for suspensions).
- Select the smallest package size a product is available in to cover the patient for the duration of treatment, if applicable (e.g., antibiotics needed for a specified amount of time such as 7 or 10 days).

### *Which auxiliary labels should I apply to ear or eye med prescriptions?*

- Route of administration: “For the ear” or “For the eye.”
- Administration instructions: “Shake well” for suspensions.
- Safety: “May impair ability to drive” for eye gels, ointments, and pilocarpine eye drops.
- Storage: “Use by” or “Refrigerate” for products that require refrigeration after dispensing.

### *How can I help patients use OTC or Rx ear or eye meds safely?*

- Point out administration instructions on product labeling.
- Share appropriate beyond-use dates for meds.
- Refer patients getting multiple OTC or Rx eye drops to the pharmacist for additional instructions.
- Refer patients who wear contact lenses to the pharmacist if they are getting OTC or Rx eye drops.

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