

variety of diseases. These drugs have names that end in *-mab*. Another monoclonal antibody drug used to treat ophthalmic conditions is teprotumumab-trbw (Tepezza), which is given intravenously for the treatment of thyroid eye disease.

The intravitreal route is also used to inject anti-infective agents into the eye for intraocular infections, such as herpes simplex and herpes zoster viral infections and bacterial endophthalmitis. Injections into the anterior chamber of the eye are also used to treat certain forms of endophthalmitis.

## Oral Systems

Drugs taken orally (by mouth) include tablets, capsules, and liquids. Oral drug intake belongs to the systemic drug delivery category because, as with certain types of bodily injections, the active agent must travel through 1 or more other body systems before reaching the eye. The practice of ophthalmology uses few oral drugs. A notable exception is acetazolamide (Diamox), a systemic drug used in the treatment of glaucoma and **idiopathic** (of unknown cause) intracranial hypertension (pseudotumor). The ophthalmic medical assistant should be aware of all systemic medications used to treat glaucoma, infections, allergic reactions, and neurologic conditions that affect the eye.

## Implants

Intravitreal implants are intended to provide sustained drug delivery to the posterior segment of the eye. Although these implants are surgically inserted, it is important that ophthalmic assistants be aware of this drug delivery system. The therapeutic benefit of implants is a constant, sustained release of medication. Many patients are not capable of administering medications on a frequent or around-the-clock schedule for long periods. Intravitreal inserts eliminate the doctor's concern about the patient's adherence to instructed medication administration. Several different forms of medication can be delivered via intravitreal implant. The most commonly delivered drugs are corticosteroids used in the treatment of intraocular inflammation and vascular diseases. The fluocinolone acetonide intravitreal implant (Retisert, Illuvien, Yutiq) releases 0.25–0.4 mcg of fluocinolone acetonide (a corticosteroid) per day for approximately 30–36 months. Figure 6-2 shows the Retisert implant inside the eye. The dexamethasone intravitreal implant (Ozurdex) is a biodegradable, sustained-release implant of dexamethasone (another corticosteroid). Its duration of action is 3–6 months.



**Figure 6-2** Retisert, an intravitreal implant, provides sustained drug delivery to the posterior segment of the eye. (Courtesy of Bausch + Lomb.)

## Improving Adherence to Treatment

In order to increase patients' adherence to treatment and to improve absorption, several recommendations for patients have been suggested:

- Take eyedrops with other routine tasks, such as toothbrushing.
- Take multiple eyedrops at least 5 minutes apart to avoid washing out or diluting each medication but close enough in timing to prevent missing the sequence.
- Set alarms on a watch or smartphone as reminders to take the medication.
- Prepare a daily log or schedule and mark off each drop after use.

## Administration of Topical Eyedrops and Ointments

Most topical ophthalmic drugs are available as a solution, a suspension, or an ointment. The ophthalmic medical assistant commonly aids the ophthalmologist by instilling eyedrops or applying ointments to patients in the office. Refer to Procedure 6-1 for step-by-step instructions.

## Purposes and Actions of Drugs

Ophthalmic drugs may be used as a part of a test to diagnose eye disorders, as a principal treatment of eye conditions, or as an adjunct to surgical eye treatment. In addition to their desired action for each use, drugs of all kinds have certain side effects, some of which can be harmful.

## Procedure 6-1 Administering Eyedrops and Ointments

### Preliminaries

1. Have the patient sit or lie down.
2. Wash your hands thoroughly.
3. Check the physician's instructions—what medication and which eye?
4. Select the correct medication and strength, and check the expiration date. Always read the label. Many ophthalmic medication bottles look alike.
5. If the medication to be used is a suspension, shake the container well to ensure the drug is distributed consistently throughout the liquid.
6. To maintain sterility of the bottle contents, do not allow the inside edge of the bottle cap to contact any surface or object other than the bottle. Avoid touching the bottle tip to the eyelids, eyelashes, or surface of the eye.

### Instilling Eyedrops

Improperly instilled eyedrops do not reach the eye. The following technique helps ensure optimal drug delivery.

1. Have the patient recline or tilt the head far back. If a patient has difficulty bending the neck back, have them recline in the exam chair.
2. Ask the patient to look up, with both eyes open.
3. Use the little finger or ring finger of the hand holding the bottle to gently pull down the skin over the cheekbone, pulling the lower eyelid down and out. This motion exposes the conjunctival cul-de-sac, creating a cup to catch the drops.
4. Squeeze the bottle gently to expel a drop of medication. Try to direct the drop toward the cul-de-sac, not toward the sensitive surface of the cornea (Fig A).
5. Instruct the patient to close both eyes gently for 2 minutes and apply light pressure at the inner corner of the eyelids for 60 seconds (Fig B). These actions help prevent systemic absorption by reducing the amount of the drug that drains into the lacrimal system, to the nose, and eventually down the throat. Alternatively, and just as effectively, a patient can be instructed

to keep their eyelids gently closed for 2 minutes to decrease systemic absorption. These maneuvers also increase the time available for absorption of the drug and thereby improve its effectiveness.

6. Wipe any excess drops from the patient's eyelids with a clean tissue.
7. Record the following information in the patient's chart:
  - medication name and strength
  - time administered
  - which eye received the medication

Video 6-1 demonstrates the procedure.



#### Video 6-1

Instilling eyedrops.

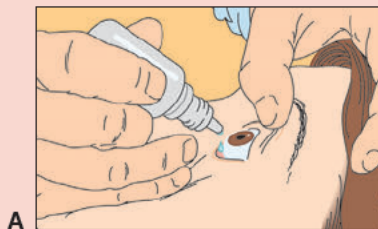
Courtesy of Richard C. Allen, MD, PhD.



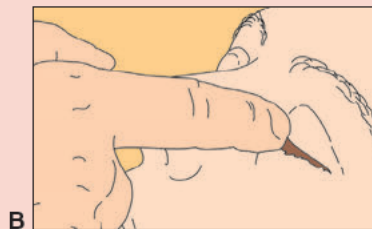
### Applying Ointments

Perform steps 1-6 in the Preliminaries section. Then continue with steps 1-5 below.

1. If the tube of ointment has been opened prior to this use, express one-half inch of ointment onto a fresh cotton ball, gauze, or tissue and discard it.
2. Squeezing the tube lightly and, with even pressure, apply the ointment along the conjunctival surface of the lower eyelid, moving from the inner to the outer canthus (Fig C). Usually 1 half-inch of ointment is enough. Avoid touching the tip of the tube to the eye, eyelashes, or skin to prevent contamination of the tube. With a twisting motion, detach the ointment from the tip of the tube.
3. Instruct the patient to close the eyes gently.
4. Wipe any excess ointment from the patient's skin with a fresh cotton ball, gauze, or tissue; then discard it properly.
5. Record the application of ointment in the patient's chart, as described in step 7 in the section "Instilling Eyedrops," above.



A



B



C