Understanding Medical Terminology and Pharmacology Associated With the Eye: Glaucoma, Dry Eye, and Conjunctivitis

Posttest and Rationale

1. Keratitis is an inflammatory condition involving which anatomical structure of the eye?
   A. Conjunctiva
   B. Cornea***
   C. Retina
   D. Ciliary body
   **Correct answer: B**
   Answer to question 1 is found in Table 1.

2. Medications that are used to treat glaucoma reduce intraocular pressure by which of the following mechanisms?
   A. Reduce aqueous humor production by the ciliary body
   B. Increase outflow of aqueous humor via the uveoscleral pathway
   C. Increase outflow of aqueous humor through Schlemm’s canal
   D. All of the above***
   **Correct answer: D**
   Based on the above-mentioned mechanisms of disease, there are 3 pharmacologic targets that medications exploit to reduce IOP and, thus, the clinical progression of glaucoma: (1) decrease aqueous humor production by the ciliary body, (2) increase aqueous humor outflow through Schlemm’s canal, and (3) increase aqueous humor drainage via uveoscleral outflow.

3. Medications from which drug class are the preferred initial treatment choice in patients with open-angle glaucoma?
   A. Beta blockers
   B. Adrenergic agonists
   C. Prostaglandin analogs***
   D. Carbonic anhydrase inhibitors
   **Correct answer: C**
   Ideally, the goal of the therapy in patients who are affected by OAG is to lower their IOP by 20-50% (target range) with the fewest medications and least amount of side effects. Topical ophthalmic drugs are the mainstay of treatment for OAG. At the onset of OAG, a prostaglandin analog (PA) is often the preferred treatment choice.

4. Which layer of tear film is mostly responsible for reducing tear film evaporation?
   A. Lipid layer***
   B. Aqueous layer
   C. Mucous layer
   D. None of the above
   **Correct answer: A**
   The mucous and aqueous layers of tear film function to maintain viscosity and spread tears evenly over the surface of the eye, while the lipid layer delays tear evaporation.

5. Cyclosporine 0.05% ophthalmic emulsion:
   A. Should not be used with contact lenses
Cyclosporine ophthalmic emulsion 0.05% is FDA approved for the treatment of dry eye and is available by prescription only. It is generally reserved for patients with moderate-to-severe dry eye symptoms whose tear production is presumed to be suppressed due to ocular inflammation. Topical cyclosporine is an immunosuppressant that has proved to be safe and well-tolerated in the majority of patients, but may take up to 6 weeks or longer to achieve noticeable improvement. The recommended dosing schedule is 1 drop in each eye twice daily approximately 12 hours apart. Cyclosporine ophthalmic emulsion should not be administered while wearing contact lenses; however, if contact lenses are worn, they should be removed prior to the administration of the emulsion and reinserted 15 minutes following administration.

6. Which of the following is the only form of conjunctivitis where the clear use of prescription eye drops is indicated?
   A. Viral conjunctivitis
   B. Bacterial conjunctivitis***
   C. Allergic conjunctivitis
   D. All of the above
   Correct answer: B
   Although no effective treatment for viral conjunctivitis exists, artificial tears, antihistamine eye drops, and the application of cold compresses to the affected eye(s) have shown to provide symptomatic relief. Bacterial conjunctivitis is commonly treated with broad spectrum eye drop antibiotics (Table 5). Treatment of allergic conjunctivitis consists of limiting exposure to the offending antigen and/or the use of saline eye solutions or artificial tears to dilute and remove allergens. Depending on the patient and their underlying conditions, artificial tears, ocular decongestants, antihistamines, mast cell stabilizers, nonsteroidal anti-inflammatory drugs, and corticosteroids may be indicated.

7. Approximately what percentage of patients have trouble administering a single eye drop onto their eye?
   A. 90%
   B. 50%***
   C. 25%
   D. 10%
   Correct answer: B
   Data suggest that nearly 50% of patients have trouble accurately administering a single drop onto their eyes.

8. According to the American Academy of Ophthalmology color-coding system, a prescription eye drop medication with a yellow cap designates which drug class?
   A. Anti-infective
   B. Mydriatic
   C. Beta blocker***
   D. Prostaglandin analogue
   Correct answer: C
   Answer is located in Table 6.
9. Once a patient applies 1 drop onto their eye from an eye drop solution bottle, how long should they wait before administering a gel-forming eye drop to same affected eye(s)?
   A. At least 1 minute
   B. At least 2 minutes
   C. At least 5 minutes***
   D. They can administer the gel-forming product immediately following the solution eye drop

Correct answer: C

If a patient’s eye drop regimen requires the use of a suspension or gel-forming eye drop plus a solution eye drop at the same time, the solution should be administered first. Also, the patient should be instructed to wait 5 minutes before administering the suspension or gel-forming eye drop. Importantly, if a patient’s regimen includes an ophthalmic ointment, it should be the last formulation administered to the eye. The patient should be instructed to wait at least 10 minutes after the application of solution or gel eye drops before administering an ophthalmic ointment. This will help maximize the therapeutic benefit of each medication.

10. An antibiotic eye drop prescription reads: tobramycin 0.3% solution, instill 1 drop onto each eye 4 times daily for 10 days. How many milliliters (mL) of tobramycin are required to correctly fill this prescription (use the conversion 20 drops/mL)?
   A. 6 mL
   B. 3 mL
   C. 4 mL***
   D. 7 mL

Correct answer: C

Total drops needed for the prescription:
- The number of drops/day x duration of therapy in days = total drops needed
- The number of drops needed ÷ the number of drops/mL = the amount of mL needed
- Therefore \(8 \text{ drops/day} \times 10 \text{ days} = 80 \text{ drops} \rightarrow 80 \text{ drops} ÷ 20 \text{ drops/mL} = 4 \text{ mL}\)