

DiPiro's Pharmacotherapy: A Pathophysiologic Approach, 12th Edition >

Chapter e11: Minor Ophthalmic Disorders

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UPDATE SUMMARY

Update Summary

September 12, 2023

The following were updated:

- Added reference to [Chapter e116](#), Drug-Induced Ophthalmic Disorders, for prescription treatment options
- Removed gender-specific pronouns throughout the text

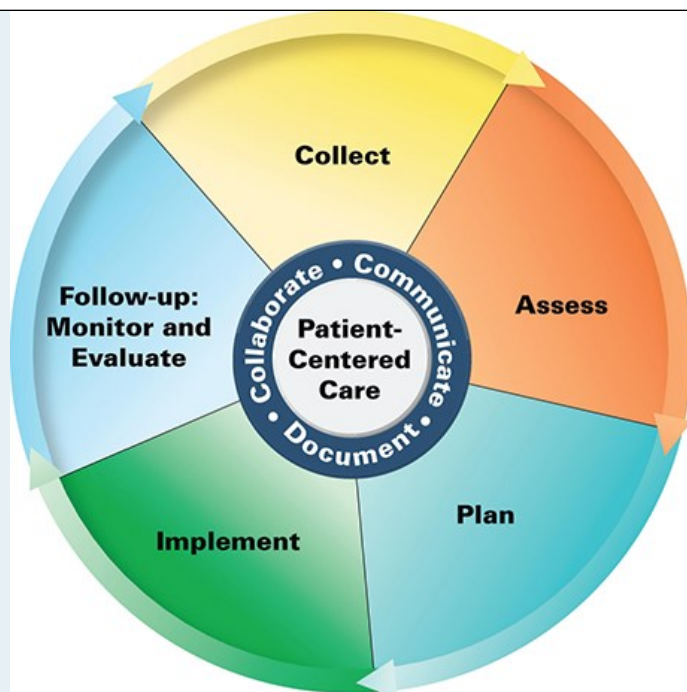
KEY CONCEPTS

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- 1 Pharmacists are often the first healthcare provider that patients will seek with various eye complaints.
- 2 It is crucial to understand the various products available over-the-counter (OTC) to provide appropriate recommendations.
- 3 Healthcare professionals should also be familiar with eye conditions that do require referral to a medical provider for further evaluation.

PATIENT CARE PROCESS

Patient Care Process for Eye Complaints



Collect

- Patient characteristics (eg, age, sex, pregnancy status)
- Patient medical history (personal and family)
- Social history (eg, tobacco/ethanol use)
- Current medications including prescription, OTC aspirin/NSAID use, herbal products, dietary supplements
- Objective data
 - Appearance of ophthalmic redness, inflammation, or any other signs

Assess

- Appropriateness for self-care (eg, red flags that would indicate referral or higher level of care such as bleeding or failed previous attempts at treatment)
- Presence of anything physically blocking the eye or eyelid
- Presence of common provoking factors (eg, recent drug use, new medications, changes in weather, history of allergies)
- Ability/willingness to administer eye drops correctly (eg, health literacy, age of patient)
- Ability/willingness to pay for OTC options that are not covered by insurance
- Ability/willingness to follow-up with provider if symptoms do not improve

Plan*

- Drug therapy regimen including specific eye drops and/or medication(s), dose, route, frequency, and duration
- Monitoring parameters including efficacy (eg, resolution/improvement in symptoms); frequency and timing of follow-up

- Patient education (eg, purpose of treatment, medication administration technique)
- Self-monitoring for resolution of symptoms
- Referrals to other providers when appropriate (eg, primary care provider, urgent care)

Implement*

- Provide patient education regarding all elements of treatment plan
- Use motivational interviewing and coaching strategies to maximize adherence
- Encourage patient to return with any questions or contact their provider if their complaint worsens

Follow-up: Monitor and Evaluate

- Resolution of eye symptoms (eg, redness, pain, excessive tearing)
- Presence of adverse effects (eg, burning, stinging)
- Patient adherence to treatment plan
- Reevaluate if necessary

**Collaborate with patient, caregivers, and other healthcare professionals.*

Design a list of questions for a patient who is presenting with complaints of dry eyes. Which medications and/or disease states would you screen when reviewing their medication lists? What would be your initial OTC recommendation for symptom relief? This activity will develop your skills with collect, assess, and plan within the Patient Care Process.

INTRODUCTION

1 When it comes to ophthalmic complaints, there are many considerations and other causes to rule out prior to making a pharmacologic recommendation. Patients will sometimes present in the pharmacy or primary care setting with dry eyes, burning eyes, or obstructed vision, or for help selecting appropriate contact lens solutions. While patients may seek a quick cure, the healthcare professional must also realize that a full assessment is encouraged for each patient complaining of symptoms to determine if it is appropriate to use nonpharmacologic or pharmacologic treatments that are available without a prescription or refer to another provider.

This chapter reviews common eye complaints and evidence-based recommendations for self-care. Please refer to [Chapter e116](#), Drug Induced Ophthalmic Disorders, for prescription options for common ophthalmic disorders.

DRY EYES

Collect. Dry eye disease, or keratoconjunctivitis sicca, is one of the most common complaints when patients visit the eye doctor, and its prevalence is estimated between 7% and 33%.¹ Risk factors for the development of dry eyes include increasing age and female sex.² While onset of dry eyes is often unpredictable, it may correlate with exposure to various changes in environment and current medications.

Patients with dry eyes may present with or without redness of the eyes with various complaints that will need a review of their current medical history and other predisposing factors. Factors such as weather, current medications, recent exposure, and previous experience with the condition are essential in triage and making recommendations for therapy.

Assess. The first step in evaluating a patient with dry eyes is to evaluate the complaints and medical history including any current medications or environmental triggers. Patients may not always recognize that environmental factors could play a role so it is essential to ask for that information. Since dry eyes may be caused by a variety of medications, perform a medication reconciliation with the patient's current medication list. Some of the medications to check for include antihistamines, decongestants, antidepressants, and hormone replacement therapy.³ While this is not the only mechanism that can cause dry eyes, medications are frequently implicated. If offending medications are identified during reconciliation, advise the patient to stop using if appropriate and recommend an alternative product that would minimize the potential for dry eyes to return.

Plan. Once a thorough medication reconciliation is complete, rule out for any red flags such as complaints of any discharge, blurry vision, or difficulty with vision. Patients with those symptoms should be referred to a medical provider for further evaluation.

Implement. If there are no red flags or urgent symptoms needing further evaluation, the choice of best initial option should be discussed with the patient. A number of factors contribute to selection of an initial treatment option. These may include cost, dosage form (suspension vs solution), administration times, previous experience with a product, and any potential drug or nondrug allergies.

2 When considering OTC treatment for dry eyes, the first-line recommendation is artificial tears, which may include cellulose, polyethylene glycol, and a preservative. Each of these ingredients have a specific role in dry eye treatment and many come in a variety of forms such as liquid, gel, and ointment. Preservative-free forms are also available; these are preferred in patients who wear contact lenses.

Artificial tears are evidence-based and have been proven to improve patient symptoms.⁴ These products include cellulose ethers, such as hydroxyethylcellulose, carboxymethylcellulose, and hydroxypropyl methylcellulose. Other ingredients used in dry eyes include white petrolatum to assist with lubrication of the eye. There are several randomized trials showing efficacy with artificial tears; anecdotal reports also show that they are effective in keeping the eyes lubricated.⁵ A starting dose for artificial tear administration is one drop in each eye, three to four times a day. Many patients experience improvement within 1 to 2 days after administration; however, it may take a week or longer in some cases. Depending on the dosage form, patients may want to consider administration in the evening. Dosage forms such as ointments or gels have specific application instructions and may cause a temporary visual disturbance while the medication is being absorbed.

3 **Follow-up.** If relief is not achieved within 1 to 2 days, a referral to the patient's primary care physician or urgent care is encouraged.

BLEPHARITIS

Collect. Blepharitis is a common eye condition characterized by inflammation of the eyelid margin, which may also present with crust on the eyelid and itchiness associated with the patient complaints.^{6,7} Patients with this condition may have been diagnosed as a child and present seeking OTC symptom relief. Blepharitis is often considered to be permanent and it is crucial for patients to understand it as a chronic condition as they approach with any questions. The chronic nature of blepharitis may make the conversation difficult when discussing potential treatment options. If left untreated, complications from blepharitis include the formation of a sty (hordeolum, a bacterial infection of an oil gland in the eye) or chalazion (cyst in eyelid caused by blocked oil gland).

While blepharitis is one of the most common eye disorders and patients may present with questions, the incidence is difficult to determine. A study of patients with chronic blepharitis noted that the mean age of patients was 50 years.⁷ A separate informal survey of 5,000 US adults demonstrated that symptoms associated with blepharitis are common and that younger adults report symptoms more frequently.⁸

Potential causes of blepharitis include contact, allergen, or another type of skin condition.

Assess. While there are many potential causes for blepharitis, one is an overexpression of the bacteria naturally present in the eyelid. This normally includes *Staphylococcus aureus* and coagulase-negative staphylococci.^{9,10} Other risk factors for the development of blepharitis include dry eyes, demodex folliculorum, rosacea, and use of isotretinoin.⁹

Patients with blepharitis report symptoms of swollen itchy eyelids, crusting or matting of eyelashes upon awakening, blurred vision, and "pink eyes" (conjunctivitis). While the patient may be requesting immediate relief, it is important to assess for presence of other red flags to ensure optimal treatment.

2 Plan. Treatment for patients with blepharitis prior to referral for physician care include topical hygiene products available OTC. The healthcare professional should keep in mind the patient's manual dexterity and visual acuity when instructing them on proper self-care of blepharitis. When making recommendations for symptom relief the following products may be helpful:

- Warm compresses
- Eyelid cleansing
- Artificial tears

Implement. Apply a warm compress to the eyelids for several minutes in order to loosen the crust that may have been building up on the eyelid. When counseling patients it is important to encourage them to use warm compresses and to avoid using compresses that are too hot as to avoid burning their eyes. Eyelid cleansing is described as brief massage on the eyelids. Instruct the patient to gently rub the base of the eyelashes using a commercially available eyelid cleaner, cotton ball, or clean fingertip.

If the patient has any visual or other difficulties it may be best to refer them for further care. When performed several times weekly, eyelid cleansing may help to prevent the eyelids from becoming inflamed. Because of potential aqueous tear deficiency associated with blepharitis, artificial tears may improve symptoms when used in conjunction with eyelid cleansing and warm compresses.

3 Follow-up. Patients with suspected blepharitis who do not achieve relief within a few days should be referred for medical evaluation.

CONJUNCTIVITIS

Collect. Conjunctivitis, also known as “pink eye,” refers to the inflammation of the conjunctiva within the eye. This thin clear membrane can, at times, become inflamed and result in various presenting symptoms. Conjunctivitis affects approximately six million people annually in the United States with a cost estimated between \$300 and \$800 million.¹¹

Assess. Symptoms of conjunctivitis may include a pink color in the whites of the eye(s), increased tear production, itching, blurred vision, irritation, and crusting of the eyelids usually in the early morning upon awakening. There are various types of conjunctivitis including bacterial, viral, allergic, and contact conjunctivitis. Table e11-1 lists the various types of conjunctivitis that may be seen in the community; however, other types do exist but will not be covered in this section. While bacterial conjunctivitis is more common in children, viral remains the most prevalent among all age groups and typically presents in the winter months from December through April. One of the key clinical features that may help differentiate referral versus self-treatment is the presence or absence of discharge. Discharge may be present in patients with bacterial conjunctivitis, which would therefore prompt referral to the provider for prescription treatment. Red flags that should prompt referral for further evaluation could include reduction of visual acuity, an inability to open the eye, or severe headache associated with the onset of symptoms.

TABLE e11-1

Key Characteristics of Bacterial, Viral, and Allergic Conjunctivitis

Etiology	Condition	Onset	Symptoms	Options
Bacterial	Acute	Acute	Tearing, lid crusting	Symptomatic treatment, refer to provider
	Chronic	Chronic	Lid crusting	
Viral	Adenoviral	Acute	Tearing, lid crusting upon awakening	Symptomatic treatment, cold compresses
	Herpetic	Acute	Tearing	
Allergic	Seasonal	Seasonal	Itching, tearing	Symptomatic relief (antihistamines, mast cell stabilizers, decongestants, cold compresses)
	Vernal	Seasonal	Itching, mucous discharge	
	Giant Papillary	Acute	Itching, contact lens intolerance, mucous discharge	

Plan. Viral conjunctivitis is highly contagious; it can be spread by touching other individuals or objects. It is the most common type of conjunctivitis and may also result in many pharmacist visits for symptom relief. Similar to any other virus, the infection will need to run its course over time, which may be burdensome to the patient. Generally, viral conjunctivitis will resolve 2 to 3 weeks after initial symptom presentation, during which time patients may have consistent morning “crust” upon awakening.

Allergic conjunctivitis occurs due to contact with external triggers such as dander, pollen, and other environmental triggers. It affects up to 40% of the population and many allergy sufferers present with seasonal allergic conjunctivitis annually during allergy season.

2 Implement. Treatment for viral, allergic, and contact conjunctivitis usually includes OTC self-care products available from the pharmacy. A previous study was conducted looking at prescription versus OTC treatment for presumed viral conjunctivitis.¹² This study, conducted in Brazil, ultimately found that treatment with a topical steroid was not superior to artificial tears in acute viral conjunctivitis. Healthcare professionals must evaluate each patient individually and with consideration of presenting signs and symptoms. Product recommendations should take into account the specific symptoms that the patient is reporting. Many OTC products contain a combination of various ingredients which may not be helpful to the patient.

OTC products for viral and bacterial conjunctivitis containing a topical decongestant/antihistamine may be used 1 to 2 drops in each eye four times daily as needed plus/minus eye lubricant drops 1 to 2 drops every 1 to 6 hours as needed. Allergic conjunctivitis may respond to the previously stated agents but another possibility is the use of mast cell stabilizers and/or antihistamines. Healthcare professionals should also explain that while the patient may experience some relief, the medication will not reduce the virus activity or help the eye heal any faster. Cold compresses are another option to help with symptom relief and can be recommended in almost all cases.

3 Follow-up. Patients should also be made aware that the symptoms may worsen 3 to 5 days from initial onset before starting to resolve but if they are experiencing any loss of vision or red flag symptoms, it is advisable to seek out their medical provider for further evaluation.

CONTACT LENS CARE AND COMPLICATIONS

An estimated 30 million people in the United States wear contact lenses.¹³ The majority are women and the average age worldwide is 31 years old. While pharmacies in the United States generally do not sell contact lenses, patients often present with questions for the pharmacist about contact lens care and troubleshooting various problems. Between 40% and 90% of contact lens wearers do not properly follow the care instructions, putting them

at risk for various eye infections, including keratitis, corneal abrasions, and corneal infiltrates.^{14,15} Cleaning and maintenance of contact lenses is critical to ensuring safe and effective use.

Collect. To provide recommendations to patients who wear contact lenses, healthcare professionals need information about the wide variety of available styles and options. While some patients prefer daily contact lenses that may be disposed of, others may select reusable contact lenses that require cleaning every evening overnight. Some patients may also prefer to use contact lenses that are approved for overnight use.

The American Optometric Association has many recommendations for the successful use of contact lenses. Some of the recommendations include proper hand hygiene, appropriate storage conditions, and use of fresh solution daily. Products are available for ensuring adherence to these recommendations.

Assess. Patients may present to the pharmacy requesting advice and/or assistance with selection of contact solution, saline, and other nonpharmacologic treatment. Before recommending self-care products, the health professional should ensure that the patient is following proper hygiene procedures and is handling contact lenses in accordance with the manufacturer instructions. General recommendations that can be provided include the following:

- Wash hands with soap and water, and dry completely before handling contact lenses.
- Avoid sleeping in contact lenses unless such use is approved by medical provider.
- Avoid showering in contact lenses to limit the amount of water available to enter the lenses.
- Use only fresh contact solution each time the contact lenses need to be cleaned.
- Rinse your contact lenses with contact lens disinfecting solution as instructed by the manufacturer. Do not use saliva or water to attempt to clean your contact lenses

2 Plan. Various solutions and disinfecting agents are available without a prescription. Regardless of the brand of solution chosen, healthcare professionals should advise the patient to clean their hands each time they handle contact lenses to reduce the chances of infection. Before selecting any contact lens solution, patients should be encouraged to communicate with their eye professional to see if a specific solution is recommended based on the lens material. Patients should also be sure to check the expiration dates of solutions and cleaners in their homes and discard expired products.

Implement: A multipurpose solution is an all-in-one product that cleans and disinfects soft contact lenses. It is the most commonly used solution among contact lens wearers and is generally the most affordable. The following recommendations can be provided safely to patients wishing to use multipurpose solution¹⁶:

- Store contact lenses in fresh solution each time they are cleaned
- Rinse the contact lens storage case in fresh solution every day
- Store the clean case upside down in order to prevent microbial growth
- Change contact lens case at least every 3 months, potentially more often depending on specific manufacturer instructions

Hydrogen peroxide-based systems may be used in the case of an allergy to an ingredient in the multipurpose solution, or simply for patient preference. These solutions are preservative free and thus may represent an appeal to various patients. They are available OTC and come with their own container that the contact lenses must be placed in prior to cleaning. It is important to inform the patient not to use a different case other than what's provided. Changing cases and utilizing the hydrogen peroxide solution in a different case may result in significant eye burning. When using a hydrogen peroxide-based solution, patient must wait at least 4 to 6 hours before removing the contact lens and inserting them into the eye. This allows for the appropriate amount of time, during which the hydrogen peroxide is converted to saline.

Follow-up. Saline solution and daily cleansers are sometimes used on an as-needed basis if the patient believes they have something stuck in their eye or if their vision has turned slightly blurry from the lens. It is important to note that saline does not disinfect the contact lens and thus should not

be recommended without another form of cleansing/disinfecting solution.

Patients inquiring about eye care with contact lenses may also ask about eliminating red eye, dry eyes, and other eye conditions. Patients with contact lenses should not be using OTC products that include relief for red eyes or any product with preservatives. These products contain chemicals that may be harmful when used over the long-term.^{17,18} Encourage patients to use products that are preservative-free to ensure there are no harmful chemicals that could damage the eye and/or the contact lens. If using disposable contact lenses, patients should be instructed to dispose of them at the recommended duration. Patients should also be advised to use makeup and other products that are marked safe for contact lens use.

CONCLUSION

Healthcare professionals are well positioned to help patients with many common eye complaints, including contact lens challenges. There are a variety of products available OTC that may cause confusion when deciding whether to self-treat or seek out further medical attention. By conducting a thorough assessment of each patient and utilizing the patient care process, the healthcare professional can make the most evidence-based recommendation and provide relief to the patient.

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SELF-ASSESSMENT QUESTIONS

1. What is one of the most common eye complaints?
 - A. Dry eye disease
 - B. Wet eye disease
 - C. Red eyes
 - D. Excess eye lash growth
2. Patients may be more likely to have dry eyes if they are taking which ONE of the following medications?
 - A. ACE inhibitor
 - B. Leukotriene inhibitor
 - C. Antihistamine
 - D. Analgesic
3. A potential red flag that would prompt a referral to a doctor or urgent care facility would include:
 - A. Limited budget
 - B. Ocular discharge
 - C. Itching of the eye
 - D. Excess tearing
4. A patient would like a recommendation for dry eyes. After consultation and thorough medication screening you decide it is appropriate to make a recommendation. Which of the following choices would be the BEST initial option for treatment of dry eyes?
 - A. Petroleum jelly

-
- B. Astringent drops
 - C. Antihistamine drops
 - D. Artificial tears
5. When counseling a patient on the expectations for relief when treating dry eyes, what would be an appropriate amount of time to wait until seeking further care if there is no improvement?
- A. 3 to 4 weeks
 - B. 6 to 7 days
 - C. 1 to 2 days
 - D. 6 to 8 weeks
6. A patient presents for consultation and evaluation with an eye complaint. They report that for the past 2 days they have woken up with a “crust” around their eyelids and need to rinse their eyes as soon as they wake up. Which eye condition does this most closely relate to?
- A. Blepharitis
 - B. Dry eye disease
 - C. Glaucoma
 - D. Cataracts
7. All of the following are appropriate OTC recommendations for blepharitis except:
- A. Warm compresses
 - B. Eyelid cleansing
 - C. Topical NSAIDs
 - D. Artificial tears
8. Which of the following disease states include complaints of pink color in the eyes, increased tear production, and crusting of the eyelids in the morning?
- A. Dry eyes
 - B. Macular degeneration
 - C. Diabetic macular edema
 - D. Conjunctivitis
9. Various types of conjunctivitis exist and patients will require education on the various differences. Which one of the following types of conjunctivitis is NOT able to be treated with OTC products?
- A. Viral
 - B. Allergic
 - C. Contact

D. Bacterial

10. Antihistamines would be most appropriate in which one of the following types of conjunctivitis?

A. Viral

B. Allergic

C. Contact

D. Bacterial

11. Which of the following statements regarding contact lens wearers is true?

A. Between 40% and 90% of contact lens wearers do not follow the care instructions.

B. Cleaning and maintenance at least monthly is required for optimal care of the lenses.

C. Contact lenses are available to all patients without a prescription.

D. Daily disposable contact lenses require cleaning every night to ensure optimal use.

12. All of the following recommendations should be followed when using multipurpose solution except:

A. Store contact lenses in fresh solution each time they are cleaned.

B. Rinse the contact lens storage case in fresh solution every day.

C. Store the clean case upside down in order to prevent germs.

D. Utilize boiling water for cleaning the storage case every other day.

13. When is it appropriate for a contact lens wearer to use saline solution to rinse their eyes?

A. It is never appropriate to use saline solution when wearing contacts.

B. Saline solution is appropriate on an as-needed basis if the patient believes something is in their eye.

C. Saline solution should be heated up to ensure all bacteria have been removed prior to using.

D. Contact lens wearers may utilize saline solution in place of multipurpose and/or cleansing solution as frequently as needed.

14. When is it appropriate for a patient who wears daily disposable contact lenses to reuse them the following day?

A. Contact lenses may be reused as long as it is within 24 hours from the time the package is open.

B. Daily contact lenses are meant for single use only and should never be worn the following day unless advised by a healthcare professional.

C. Patients who wear daily contact lenses may reuse their contacts after ensuring they are soaked overnight in the appropriate solution.

D. Patients who wear daily contact lenses may reuse them until there is visible deterioration in the lens. This will allow for significant cost savings.

15. A patient presents with complaints of itchiness and tearing in both eyes since yesterday. No current medications. Denies any crusting around eyes when waking up in the morning. What would be the most appropriate diagnosis and treatment for this patient given the information provided?

A. Bacterial infection: Refer to healthcare provider for assessment

B. Viral infection: Refer to healthcare provider for assessment

C. Seasonal allergies: Recommend OTC topical agent to help with symptom management

D. Allergic reaction: Recommend OTC oral diphenhydramine every 6 hours as needed

SELF-ASSESSMENT QUESTION-ANSWERS

1. **A.** Dry eye disease is one of the most common complaints. Its prevalence has been estimated between 7% and 35%.
2. **C.** Use of antihistamines including diphenhydramine and loratadine results in dry eyes, dry mouth, constipation, and other anticholinergic properties. Patients should be encouraged to use them for the shortest duration necessary.
3. **B.** Ocular discharge requires prompt referral to an eye specialist or urgent care as it may require further differential diagnosis and appropriate treatment with prescription medication.
4. **D.** The most appropriate initial option would be artificial tears now. If the patient returns with other complaints such as redness or if they are reporting seasonal allergies, other options such as an antihistamine may be appropriate at that time.
5. **C.** Artificial tears should work relatively quickly to help relieve dry eyes. If there is no relief after 1 to 2 days the patient should be instructed to seek further care from their physician.
6. **A.** Blepharitis is a common eye disorder that commonly results in inflammation of the eyelid margin and may result in the patient complaint of “crust.”
7. **B.** Topical NSAIDs are not available OTC and will not likely improve the symptoms or disease progression. Patients with blepharitis should be advised to keep their eyelids clean and utilize other OTC options.
8. **D.** Conjunctivitis, also known as pink eye, occurs when the conjunctiva in the eyes become inflamed and may result in various complaints from patients.
9. **D.** Bacterial conjunctivitis will require treatment with antibiotics from a medical office or clinic. While symptomatic recommendations can be made to help the patient, they should be referred to a doctor for further care.
10. **B.** As the origin of the conjunctivitis was stated to be “allergic” in nature, an OTC antihistamine would be appropriate for initial treatment of the patient’s complaint.
11. **A.** It has been reported that up to 90% of contact lens wearers do not follow the care instructions. This could include not maintaining proper hygiene, improper storage conditions, or potentially reusing disposable contact lenses.
12. **D.** It is only appropriate to use contact solution that is pre-packaged and available from a pharmacy or other store. Boiling water is not an appropriate substitute for contact solution.
13. **B.** Patients can be counseled that if something is in their eye or they believe that their contacts have become dry to utilize saline solution as needed.
14. **B.** Patients who are prescribed wearing daily disposable contact lenses should be advised to discard the lenses at the end of the day, every day. Disposable contact lenses are not indicated to be worn for more than 1 day. If the patient would like something that they could reuse on a daily basis, ensure appropriate referral to eye health professional.
15. **C.** The patient is presenting without the key complaint of crusting around the eyes. Generally speaking, when crusting around the eyes is present we are considering either bacterial or viral conjunctivitis. Since the patient is presenting with itching in both eyes and tearing, this could indicate seasonal allergies, with appropriate recommendation the patient would likely see relief in a matter of hours.