INTRODUCTION — Conjunctivitis is a common patient complaint. It is the most likely diagnosis in a patient with a red eye and discharge. (See "Evaluation of the red eye").

Acute conjunctivitis is usually a benign, self-limited condition or one that is easily treated. When making a diagnosis of acute conjunctivitis, one needs to make certain that sight-threatening and pathologic processes have been ruled out. In contrast to acute conjunctivitis, these entities, such as acute angle closure glaucoma, iritis, and infectious keratitis, must be managed by ophthalmologists and will not be discussed here.

DEFINITIONS — Conjunctivitis literally means "inflammation of the conjunctiva." The conjunctiva is the mucous membrane that lines the inside surface of the lids and covers the surface of the globe up to the limbus (the junction of the sclera and the cornea). The portion covering the globe is the "bulbar conjunctiva," and the portion lining the lids is the "tarsal conjunctiva."

The conjunctiva is comprised of an epithelium and a substantia propria. The epithelium is a non-keratinized squamous epithelium that also contains goblet cells. The substantia propria is highly vascularized and is the site of considerable immunologic activity.

The conjunctiva is generally transparent. When it is inflamed, as in conjunctivitis, it looks pink or red at a distance. Up close the examiner can discern fine blood vessels, termed "injection," in contrast to extravasated blood, which is seen in subconjunctival hemorrhage. Degenerative, inflammatory, and infiltrative processes can cause the conjunctiva to become opacified, taking on a white, yellow, or fleshy appearance. All conjunctivitis is characterized by a red eye, but not all red eyes are conjunctivitis. (See "Evaluation of the red eye").

Infectious conjunctivitis in the neonate is discussed separately. (See "Chlamydia trachomatis infections in the newborn" and "Gonococcal infection in the newborn").

ETIOLOGY AND CLINICAL MANIFESTATIONS — Acute conjunctivitis can be classified as infectious or noninfectious and further divided into four main types:

- Infectious
  - Bacterial
  - Viral
- Noninfectious
  - Allergic
  - Nonallergic

The prevalence of each is different in pediatric and adult populations [1-3]. Bacterial conjunctivitis is more common in children than in adults. Although published studies suggest that the majority of cases in children are bacterial [1,3], the prevalence of bacterial conjunctivitis seen in studies presumably reflects the greater likelihood that patients with copious discharge will present for care. Clinical experience suggests that most infectious conjunctivitis is viral in both adults and children.

Bacterial conjunctivitis — Bacterial conjunctivitis is commonly caused by Staphylococcus aureus, Streptococcus pneumoniae, Haemophilus influenzae, and Moraxella catarrhalis. S. aureus infection is common in adults; the other pathogens are more common in children [4].

Bacterial conjunctivitis is spread by direct contact with the patient and his or her secretions or with contaminated objects and surfaces. It is highly contagious. As an example, outbreaks have been described caused by atypical unencapsulated strains of S. pneumoniae in which attack rates were as high as 14 percent [5,6].
Patients with bacterial conjunctivitis typically complain of redness and discharge in one eye, although it can also be bilateral. Similar to viral and allergic conjunctivitis (see below), the affected eye often is "stuck shut" in the morning. This point of history is not generally useful in distinguishing the various types of conjunctivitis. As an example, in a cohort of 184 adults with a red eye and either an eye stuck shut in the morning or purulent or mucopurulent discharge, among 57 patients with bacterial conjunctivitis, 53 percent had one eye stuck shut and 39 percent had two eyes stuck shut; among 120 patients without bacterial conjunctivitis, 62 percent had one eye stuck shut and 11 percent had two eyes stuck shut [7].

The purulent discharge continues throughout the day. The discharge is thick and globular; it may be yellow, white, or green (picture 1). The appearance differs from that of viral or allergic conjunctivitis, which often present with a mostly watery discharge during the day, with a scanty, stringy component that is mucus rather than pus.

On examination, the patient with bacterial conjunctivitis typically will have purulent discharge at the lid margins and in the corners of the eye. More purulent discharge appears within minutes of wiping the lids. This contrasts with patients with viral or allergic conjunctivitis, in whom the eyes appear watery, there may be mucus present on close inspection of the tear film or if one pulls down the lower lid, but pus does not appear spontaneously and continuously at the lid margin and in the corners of the eye.

**Hyperacute bacterial conjunctivitis** — Neisseria species, particularly N. gonorrhoeae, can cause a hyperacute bacterial conjunctivitis that is severe and sight-threatening, requiring immediate ophthalmologic referral [8]. The organism is usually transmitted from the genitalia to the hands and then to the eyes. Concurrent urethritis is typically present.

The eye infection is characterized by a profuse purulent discharge present within 12 hours of inoculation [9]; the amount of discharge is striking. Other symptoms are rapidly progressive and include redness, irritation, and tenderness to palpation. There is typically marked chemosis, lid swelling, and tender preauricular adenopathy. Gram negative diplococci can be identified on Gram stain of the discharge.

These patients require hospitalization for systemic and topical therapy and for monitoring of the ocular component. Keratitis and perforation can occur.

**Viral conjunctivitis** — Viral conjunctivitis is typically caused by adenovirus, with many serotypes implicated [10]. The conjunctivitis may be part of a viral prodrome followed by adenopathy, fever, pharyngitis, and upper respiratory tract infection, or the eye infection may be the only manifestation of the disease. Viral conjunctivitis is highly contagious; it is spread by direct contact with the patient and his or her secretions or with contaminated objects and surfaces [11].

Viral conjunctivitis typically presents as injection; watery or mucoserous discharge (picture 2); and a burning, sandy, or gritty feeling in one eye. Patients may report "pus" in the eye, but on further questioning they have morning crusting followed by watery discharge, perhaps with some scanty mucus throughout the day.

The second eye usually becomes involved within 24 to 48 hours, although unilateral signs and symptoms do not rule out a viral process. Patients often believe that they have a bacterial conjunctivitis that has spread to the fellow eye; they do not appreciate that this is the ocular manifestation of a systemic problem, even if they are miserable from viral symptoms at the same time.

On examination there typically is only mucoid discharge if one pulls down the lower lid or looks very closely in the corner of the eye. Usually there is profuse tearing rather than discharge. The tarsal conjunctiva may have a follicular or "bumpy" appearance. There may be an enlarged and tender preauricular node.

Viral conjunctivitis is a self-limited process. The clinical course parallels that of the common cold. While recovery can begin with days, the symptoms frequently get worse for the first three to five days, with very gradual resolution over the following one to two weeks for a total course of two to three weeks. Just as a patient with a cold can have morning coughing and nasal congestion or discharge two weeks after symptoms first arise, patients with viral conjunctivitis may have morning crusting two weeks after the initial symptoms, although the daytime redness, irritation, and tearing should be much improved.

**Epidemic keratoconjunctivitis** — One form of viral conjunctivitis, epidemic keratoconjunctivitis (EKC), is particularly fulminant, causing a keratitis (inflammation of the cornea) in addition to conjunctivitis. It is typically caused by adenovirus types 8, 19, and 37 [12]; the same viral strain that causes EKC in one patient may cause ordinary viral conjunctivitis in another, probably due to variation in host immune factors. The corneal and conjunctival epithelium are both involved. In
addition to the typical symptoms of viral conjunctivitis, the patient develops a foreign body sensation and multiple corneal infiltrates barely visible with a penlight to the skilled observer. The foreign body sensation is severe enough to preclude opening the eyes spontaneously, and the infiltrates typically degrade acuity by two or three lines to the 20/40 range.

Keratitis is potentially vision-threatening, and these patients should be referred to an ophthalmologist to confirm the diagnosis and to decide if a course of topical glucocorticoids is warranted.

**Allergic conjunctivitis** — Allergic conjunctivitis is caused by airborne allergens contacting the eye that, with specific IgE, cause local mast cell degranulation and the release of chemical mediators including histamine, eosinophil chemotactic factors, and platelet-activating factor, among others. It typically presents as bilateral redness, watery discharge, and itching (picture 3). Itching is the cardinal symptom of allergy, distinguishing it from a viral etiology, which is more typically described as grittiness, burning, or irritation. Eye rubbing can worsen symptoms. Patients with allergic conjunctivitis often have a history of atopy, seasonal allergy, or specific allergy (eg, to cats).

Similar to viral conjunctivitis, allergic conjunctivitis causes diffuse injection with a follicular appearance to the tarsal conjunctiva and profuse watery or mucoserous discharge. There may be morning crusting. It is the complaint of itching and the history of allergy or hay fever as well as a recent exposure that allows the distinction between allergic and viral conjunctivitis; the clinical findings are the same.

In some cases of allergic conjunctivitis, there is marked chemosis (conjunctival edema); in extreme instances, there can be bullous chemosis, in which the bulging, edematous conjunctiva extends forward beyond the lid margins. Bullous chemosis is most commonly seen in patients with extreme hypersensitivity to cats. A detailed discussion of allergic disease is presented separately. (See "Allergic conjunctivitis: Clinical manifestations and diagnosis").

**Noninfectious, nonallergic conjunctivitis** — Patients can develop a red eye and discharge that is not related to an infectious or inflammatory process. The discharge is more likely mucus than pus. Usually the cause is a transient mechanical or chemical insult.

- Patients with dry eye may report chronic or intermittent redness or discharge and may interpret these symptoms as being related to an infectious cause.
- Patients whose eyes are irrigated after a chemical splash may have redness and discharge; this is often related to the mechanical irritation of irrigation rather than superinfection.
- A patient with an ocular foreign body that was spontaneously expelled may have redness and discharge for 12 to 24 hours.

All of these causes generally improve spontaneously within 24 hours.

**Chlamydial infections**

**Trachoma** — Conjunctivitis is the major clinical manifestation of active trachoma, a disorder that is largely limited to endemic areas in underdeveloped regions. Issues related to trachoma are discussed separately. (See "Overview of trachoma", section on ‘Active trachoma’.)

**Adult inclusion conjunctivitis** — Adult inclusion conjunctivitis is not strictly an acute conjunctivitis, but rather a chronic, indolent conjunctivitis. It is a sexually transmitted infection caused by certain serotypes of Chlamydia trachomatis. Concurrent asymptomatic urogenital infection is typically present.

The eye infection presents as a unilateral, or sometimes bilateral, follicular conjunctivitis of weeks to months duration that has not responded to topical antibiotic therapy. There can be an associated keratitis.

**DIAGNOSIS**

**General approach** — Conjunctivitis is a clinical diagnosis of exclusion. The diagnosis can be made in a patient with a red eye and discharge only if the vision is normal and there is no evidence of keratitis, iritis, or angle closure glaucoma. A detailed description of how to take a history and examine a patient with a red eye is presented elsewhere. (See "Evaluation of the red eye").

Patients with all types of conjunctivitis complain of morning crusting and daytime redness and discharge. On examination, there should be no focal pathology in the lids such as hordeolum (stye), cancerous mound or ulceration, or blepharitis
(diffuse eyelid margin thickening and hyperemia with lash crusts) (picture 4). In these other disorders, conjunctival hyperemia, if present, is reactive rather than primary.

The redness or injection in conjunctivitis should be diffuse, involving the bulbar (globe) conjunctiva for 360° as well as the palpebral or tarsal conjunctiva (the mucus membrane on the inner surface of the lids). Another diagnosis such as foreign body, pterygium, or episcleritis should be considered if the conjunctival injection is localized rather than diffuse. (See "Pterygium" and "Episcleritis".)

The serious conditions that cause a red eye, keratitis, iritis, and angle closure, will cause 360° involvement of the bulbar conjunctiva, often in a ciliary flush pattern, but will spare the tarsal conjunctiva. (See ‘Red flags’ below.)

**Distinguishing bacterial conjunctivitis** — The signs and symptoms that distinguish bacterial conjunctivitis from other etiologies are discussed above. (See ‘Bacterial conjunctivitis’ above.)

Cultures are not necessary for the initial diagnosis and therapy of conjunctivitis. Ophthalmologists do not generally perform cultures even when they are referred cases that have not responded to initial therapy. Typically there are points in the history, findings on examination, or errors in initial diagnosis or therapy that guide subsequent therapy, rather than the detection of a resistant organism. The exception is patients with symptoms of hyperacute conjunctivitis in whom Giemsa and Gram stains may be helpful to identify Neisseria gonorrhoeae. (See ‘Hyperacute bacterial conjunctivitis’ above.)

A rapid (10 minute) test for adenoviral conjunctivitis is now available. As discussed above, adenovirus is the major cause of viral conjunctivitis and likely accounts for a significant proportion of clinical encounters for conjunctivitis. (See ‘Viral conjunctivitis’ above.) This test has reasonable sensitivity and specificity under study conditions [13] and might aid clinicians in determining a viral, as opposed to bacterial etiology, thereby avoiding empiric antibiotic therapy. Elimination of empiric antibiotic therapy has theoretical benefits including prescription drug savings, avoidance of side effects, and reduction of antibiotic resistance. A modelled cost effectiveness analysis suggests a potential for significant cost savings with point of care testing [14].

**Pitfalls in diagnosis** — Patients often call all cases of red eye "conjunctivitis" and presume that all cases are bacterial and require antibiotics. When a patient calls to report "conjunctivitis" or "pink eye," clinicians should not accept that as a diagnosis but should rather review the history, symptoms, and signs prior to treating. One should be wary of the diagnosis of conjunctivitis in any patient with a recent history of trauma; there may be a corneal or conjunctival foreign body or traumatic iritis. Warning signs for sight-threatening conditions should be excluded. (See ‘Red flags’ below.)

Patients will call all types of discharge "pus." It is worthwhile to distinguish the character of the discharge to make a more specific diagnosis. As mentioned above, in bacterial conjunctivitis the complaint of discharge predominates, while in viral and allergic conjunctivitis patients report a burning and gritty feeling or itching.

**Contact lens wearers** — The diagnosis of conjunctivitis should be made carefully in contact lens wearers, who are subject to myriad secondary chronic conjunctivities that require a change in contact lens fit, lens type, or lens hygiene, and may require suppression of hypersensitivity. More importantly, soft contact lens wearers have a high risk of pseudomonal keratitis, especially with use of extended-wear lenses [15,16]. This causes an acute red eye and discharge in association with an ulcerative keratitis. The ulcerative keratitis can lead to ocular perforation within 24 hours if it is not recognized and treated appropriately. Thus, the presence of keratitis should be ruled out prior to presuming and treating conjunctivitis. Keratitis causes objective foreign body sensation, and the patient is usually unable to spontaneously open the eye or keep it open; there is typically a corneal opacity visible with a penlight. (See ‘Evaluation of the red eye’.)

A contact lens wearer with an acute red eye and discharge should be advised to discontinue contact lens wear immediately and to be seen by an eye care provider if the symptoms do not improve in 12 to 24 hours. The patient may be treated for acute conjunctivitis only if there is no evidence of keratitis. (See ‘Evaluation of the red eye’, section on ‘Infectious keratitis’.)

Chronic conjunctivitis in these patients is best addressed by a knowledgeable optometrist/ophthalmologist team.

**Red flags** — A detailed description of how to take a history and examine a patient with a red eye is discussed elsewhere. (See "Evaluation of the red eye".) Warning signs of more serious problems that should prompt evaluation by an ophthalmologist include:
Reduction of visual acuity (concerns about infectious keratitis, iritis, angle closure glaucoma)

Ciliary flush: A pattern of injection in which the redness is most pronounced in a ring at the limbus (the limbus is the transition zone between the cornea and the sclera) (concerns about infectious keratitis, iritis, angle closure glaucoma)

Photophobia (concerns about infectious keratitis, iritis)

Severe foreign body sensation that prevents the patient from keeping the eye open (concerns about infectious keratitis)

Corneal opacity (concerns about infectious keratitis)

Fixed pupil (concerns about angle-closure glaucoma)

Severe headache with nausea (concerns about angle closure glaucoma)

Note that photophobia may also indicate corneal abrasion, a condition that can be initially treated in the primary care or emergency care setting, with referral to ophthalmology if symptoms persist. (See "Corneal abrasions and corneal foreign bodies: Management" and "Corneal abrasions and corneal foreign bodies: Clinical manifestations and diagnosis".)

THERAPY

General issues — Viral, allergic, and nonspecific conjunctivitis are all self-limited processes; specific therapy reduces symptoms but does nothing to alter the clinical course of the condition. Bacterial conjunctivitis also is likely to be self-limited in most cases (figure 1) [17]. Treatment with antibiotic eye drops, however, probably shortens the clinical course if given early, before day six [18].

Specific therapy — Therapy should be directed at the likely etiology of conjunctivitis suggested by the history and physical exam.

Bacterial — Appropriate choices for bacterial conjunctivitis include erythromycin ophthalmic ointment or trimethoprim-polymyxin B drops (table 1). The dose is 0.5 inch (1.25 cm) of ointment deposited inside the lower lid or 1 to 2 drops instilled four times daily for five to seven days. It is reasonable to reduce the dose from four times daily to twice daily, if there is improvement in symptoms after a few days.

Alternative therapies include bacitracin ointment, sulfacetamide ointment, bacitracin-polymyxin B ointment, fluoroquinolone drops, or azithromycin drops (table 1). These agents cover the most common pathogens responsible for bacterial conjunctivitis, and patients should respond to this treatment within one to two days by showing a decrease in discharge, redness, and irritation. Patients who do not respond should be referred to an ophthalmologist.

Antibiotics choice may depend on certain considerations:

- Children – Ointment is preferred over drops for children, those with poor compliance, or those in whom it is difficult to administer eye medications. Ointment stays on the lids and can have therapeutic effect even if it is not clear that any of the dose was applied directly to the conjunctiva. Because ointments blur vision for 20 minutes after the dose is administered, drops are preferable for most adults who need to read, drive, and perform other tasks that require clear vision immediately after dosing.

- Contact lens wearers – Fluoroquinolones are not first-line therapy for routine cases of bacterial conjunctivitis because of concerns regarding emerging resistance and cost. The exception is conjunctivitis in a contact lens wearer; once keratitis has been ruled out, it is reasonable to treat these individuals with a fluoroquinolone due to the high incidence of pseudomonas infection. The fluoroquinolones are effective, well-tolerated, and are extremely effective against pseudomonas.

Any contact lens wearer with a red eye should discontinue contact lens wear. If the diagnosis is conjunctivitis, contact lens wear can resume when the eye is white and has no discharge for 24 hours after the completion of antibiotic therapy. The lens case should be discarded and the lenses subjected to overnight disinfection or replaced if disposable. (See 'Contact lens wearers' above.)

Azithromycin is approved in the United States as an ophthalmic solution for bacterial conjunctivitis in patients one year of age and older. It is dosed less frequently than other ophthalmic solutions (1 drop twice daily for two days, then one drop daily for five days), but is considerably more expensive than erythromycin or sulfacetamide, and its availability raises a concern about promoting the emergence of organisms resistant to azithromycin [19].
**Sulfacetamide** ophthalmic drops are also available but are not a first-line option because of the potential for rare but serious allergic events. Aminoglycoside drops and ointments are poor choices since they are toxic to the corneal epithelium and can cause a reactive keratoconjunctivitis after several days of use.

**Viral** — There is no specific antiviral agent for the treatment of viral conjunctivitis. Some patients derive symptomatic relief from topical antihistamine/decongestants. These are available over-the-counter (Naphcon-A, Ocuhist, generics). It is worthwhile to explain that these agents treat the symptoms but not the disease; just as "cold remedies" treat the symptoms rather than the cause of a cold. Warm or cool compresses may provide additional symptomatic relief. Systemic agents play no role in viral conjunctivitis.

Some providers prescribe antibiotic ointments for viral conjunctivitis to provide lubrication. A more sensible alternative is to use nonantibiotic lubricating agents such as those used for noninfectious conjunctivitis (table 1). (See ‘Noninfectious, nonallergic conjunctivitis’ above.)

Patients must be told that the eye irritation and discharge may get worse for three to five days before getting better, that symptoms can persist for two to three weeks, and that use of any topical agent for that duration might result in irritation and toxicity, which can itself cause redness and discharge. Clinicians must be wary of trying one agent after another in patients with viral conjunctivitis who are expecting drugs to "cure" their symptoms. Patient education is often more effective than prolonged or additional therapies for patients who experience improvement but incomplete resolution of symptoms after a few days.

**Adult inclusion conjunctivitis** — Diagnosis can be confirmed with Giemsa or DFA (direct fluorescent antibody) staining of conjunctival smears or by culture or PCR of swabbed specimens.

Systemic therapy is required to eradicate the infection. Treatment is typically with doxycycline, tetracycline, erythromycin, or azithromycin.

**Allergic** — There are numerous therapies available for allergic conjunctivitis (table 1) [20,21]. This is discussed elsewhere. (See "Allergic conjunctivitis: Clinical manifestations and diagnosis".)

**Noninfectious nonallergic** — The conjunctival surface regenerates rapidly from insults that precipitate noninfectious conjunctivitis, leading to spontaneous resolution of symptoms. Nevertheless, these patients may feel better more quickly with the use of topical lubricants, which can be purchased over-the-counter as drops and ointments (table 1). Preservative-free preparations are more expensive and are necessary only in severe cases of dry eye or in highly allergic patients.

Lubricant drops can be used as often as hourly with no side effects. The ointment provides longer lasting relief but blurs vision; thus, many patients use the ointment only at bedtime. It may be worthwhile to switch brands if a patient finds one brand of drop or ointment irritating since each preparation contains different active ingredients, vehicles, and preservatives.

**Empiric approach** — Providers are often pressured to prescribe antibiotics for conjunctivitis, even when there is nothing to suggest a bacterial process. This can be a particular issue for parents because most daycare centers and schools require that students with conjunctivitis receive 24 hours of topical therapy before returning to school. Patients may sometimes request to be treated without being examined. (See ‘Returning to work, school, or sports’ below.)

We believe that no patient should be treated for conjunctivitis without an examination. In principle, only those diagnosed with bacterial conjunctivitis should receive antibiotics. If the decision is made to treat empirically with antibiotics, we recommend choosing an inexpensive nontoxic antibiotic such as erythromycin ophthalmic ointment or trimethoprim polymyxin B ophthalmic drops (except in the case of contact lens wearers as discussed above). Ointment is preferred over drops for children. (See ‘Bacterial’ above.)

**Glucocorticoid use** — Topical glucocorticoids have no role in the management of acute conjunctivitis by primary care clinicians. They can cause sight-threatening complications (eg, corneal scarring, melting, and perforation) when used inappropriately in herpes simplex, fungal, other viral or bacterial keratitis, all of which can present as a red eye and discharge. Chronic topical glucocorticoid treatments can also cause cataract and glaucoma. Ophthalmologists may prescribe glucocorticoids in certain cases of ocular allergy, viral keratitis, and chronic blepharitis. One study from a specialty eye care center in the United Kingdom suggested patients perceived benefit from a short course of topical glucocorticoids in presumed viral conjunctivitis with no harmful effect [22], but this study also found that most patients...
receiving lubricant drops also perceived benefit. Combination steroid/antibiotic drops present similar risk without proven benefit and are not recommend in the treatment of acute conjunctivitis.

Lack of response — As discussed above, patients with acute bacterial conjunctivitis should respond to treatment within one to two days by showing a decrease in discharge, redness, and irritation. Patients who do not respond should be referred to an ophthalmologist. Patients with other forms of acute conjunctivitis should respond within two weeks, and those who do not should also be referred to an ophthalmologist.

Diagnoses to consider in patients who fail to respond to therapy include dry eye, medicamentosa (drug toxicity), pterygium (see "Pterygium"), blepharoconjunctivitis, and adult inclusion conjunctivitis.

RETURNING TO WORK, SCHOOL, OR SPORTS

● Work/school – Clinicians are often asked to advise patients and families as to when it is safe to return to work or school. Bacterial and viral conjunctivitis are both highly contagious and spread by direct contact with secretions or contact with contaminated objects. Infected individuals should not share handkerchiefs, tissues, towels, cosmetics, linens, or eating utensils. The safest approach to prevent spread to others is to stay home until there is no longer any discharge, but this is not feasible for most students and for those who work outside the home. Most daycare centers and schools require that students receive 24 hours of topical therapy before returning to school. Such therapy will probably reduce the transmission of conjunctivitis due to bacterial infection but will do nothing to reduce the spread of viral infections.

We suggest advising patients to consider that their problem is like a cold, and their decision to return to work or school should be similar to the one they would make in that situation. Those who have contact with the very old, the very young, and immune-compromised individuals should take care to avoid spread of infection from their eye secretions to these susceptible people.

● Sports – For bacterial conjunctivitis, patients should not return to playing sports until they have used an antibiotic for a minimum of 24 hours and had resolution of eye drainage. Clearance to return to play for viral conjunctivitis depends on the sport. Athletes who participate in sports that are individual and/or noncontact sports (e.g., cross country running) can return when they feel able and can see clearly. If these athletes return before symptoms have resolved, they should be advised not to touch their eyes and to wash their hands frequently. Athletes who participate in contact sports or water-based sports may return to play once daytime discharge has abated, typically after about five days.

INFORMATION FOR PATIENTS — UpToDate offers two types of patient education materials, “The Basics” and “Beyond the Basics.” The Basics patient education pieces are written in plain language, at the 5th to 6th grade reading level, and they answer the four or five key questions a patient might have about a given condition. These articles are best for patients who want a general overview and who prefer short, easy-to-read materials. Beyond the Basics patient education pieces are longer, more sophisticated, and more detailed. These articles are written at the 10th to 12th grade reading level and are best for patients who want in-depth information and are comfortable with some medical jargon.

Here are the patient education articles that are relevant to this topic. We encourage you to print or e-mail these topics to your patients. (You can also locate patient education articles on a variety of subjects by searching on “patient info” and the keyword(s) of interest.)

● Basics topic (see "Patient information: Conjunctivitis (pinkeye) (The Basics)"

● Beyond the Basics topics (see "Patient information: Conjunctivitis (pinkeye) (Beyond the Basics)" and "Patient information: Allergic conjunctivitis (Beyond the Basics)"

SUMMARY AND RECOMMENDATIONS

Diagnosis

● Conjunctivitis is a common condition. The diagnosis can be made in a patient with a red eye and discharge only if the vision is normal and there is no evidence of keratitis, iritis, or angle closure glaucoma. Warning signs for these conditions are discussed above. (See ‘Red flags’ above.)

● Conjunctivitis may be infectious (bacterial or viral) or noninfectious (allergic, toxic, dryness, and others). Most infectious conjunctivitis is probably viral, although bacterial conjunctivitis is more common in children than in adults.
Viral and bacterial conjunctivitis are both highly contagious. All etiologies of conjunctivitis can cause symptoms of the eyes being stuck closed in the morning.

- A diagnosis of bacterial conjunctivitis should only be made in patients with thick purulent discharge that continues throughout the day. The discharge can generally be seen at the lid margins and at the corner of the eye. Bacterial conjunctivitis is usually unilateral but can be bilateral. Neisseria species can cause a hyperacute bacterial conjunctivitis that is severe and sight-threatening, requiring immediate ophthalmologic referral.

- Viral conjunctivitis typically presents as injection, mucoid or serous discharge, and a burning, sandy, or gritty feeling in one eye. It may be part of a viral prodrome or systemic viral illness, or it may be an isolated manifestation of viral illness. The second eye usually becomes involved within 24 to 48 hours, although unilateral signs and symptoms do not rule out a viral process. On examination there typically is only mucoid discharge if one pulls down the lower lid or looks very closely in the corner of the eye. Usually there is profuse tearing rather than discharge. The tarsal conjunctiva may have a follicular or “bumpy” appearance. There may be an enlarged and tender preauricular node. The clinical course parallels that of the common cold. The symptoms generally get worse for the first three to five days, with very gradual resolution over the following one to two weeks for a total course of two to three weeks.

- Allergic conjunctivitis typically presents as bilateral redness, watery discharge, and itching. Itching is the cardinal symptom of allergy, distinguishing it from a viral etiology, which is more typically described as grittiness, burning, or irritation; the clinical findings are the same as with viral conjunctivitis. Patients with allergic conjunctivitis often have a history of atopy, seasonal allergy, or specific allergy (eg, to cats).

- Other noninfectious conjunctivitis presents as a red eye and mucoid discharge. The usual causes are mechanical or chemical insult, or a dry eye from exposure or lack of tear production.

**Treatment**

- Bacterial conjunctivitis should be treated with inexpensive nontoxic topical antibiotics such as erythromycin ophthalmic ointment or trimethoprim-polymyxin drops (table 1). The dose is 0.5 inch (1.25 cm) of ointment inside the lower lid or 1 to 2 drops four times daily for five to seven days. The dose may be reduced to twice daily if there is improvement in symptoms after a few days. (See ‘Bacterial’ above.)

  Ointment is preferred over drops for children, those with poor compliance, and those in whom it is difficult to administer eye medications. However, ointments blur vision for 20 minutes after the dose is administered. Fluoroquinolones are the preferred agent in contact lens wearers; once keratitis has been ruled out, it is reasonable to treat these individuals with a fluoroquinolone due to the high incidence of pseudomonas infection.

- Patients with bacterial conjunctivitis should respond in one to two days with a decrease in discharge, redness, and irritation. Patients who do not respond should be referred to an ophthalmologist.

- There is no specific therapy for viral conjunctivitis, although patients may receive symptomatic benefit from topical antihistamine/decongestants or from lubricating agents like those used for noninfectious conjunctivitis (table 1).

  The management of allergic conjunctivitis is discussed separately. (See ‘Allergic conjunctivitis: Clinical manifestations and diagnosis’.)

- Patients with noninfectious conjunctivitis may feel better with topical lubricants that can be used as often as hourly (table 1).

- Primary care clinicians should not prescribe topical glucocorticoids for acute conjunctivitis.

- Although we do not recommend antibiotic therapy for nonbacterial conjunctivitis, if this is required for the patient to return to school or daycare, providers should select an inexpensive topical antibiotic such as erythromycin ointment or trimethoprim-polymyxin B drops.

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**REFERENCES**


**Bacterial conjunctivitis**

The discharge of bacterial conjunctivitis is thick and globular; it may be yellow, white, or green.

**Viral conjunctivitis**

Viral conjunctivitis typically presents as injection, watery or mucoserous discharge, and a burning, sandy, or gritty feeling in one eye.

**Allergic conjunctivitis**

Allergic conjunctivitis typically presents as bilateral redness, watery discharge, and itching.
Lids demonstrate findings of blepharitis: diffuse eyelid margin thickening and hyperemia with lash crusts.

**Effect of antibiotics on cure**

This figure shows the rates of cure in children with acute infectious conjunctivitis treated with chloramphenicol eye drops or placebo drops. Data are reported on intention-to-treat analysis and children lost to follow-up are included in the denominator in calculating percentages. Children clinically cured after 7 days were censored from the study. With exclusion of children lost to follow-up, the cumulative cure rate at 7 days was 86 percent in the chloramphenicol group and 83 percent in the placebo group. Day zero is the day of recruitment.
## Therapy of conjunctivitis

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<thead>
<tr>
<th>Empiric approach</th>
<th>Dose</th>
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<tr>
<td><strong>Erythromycin 5 mg/gram ophthalmic ointment</strong></td>
<td>One-half inch (1.25 cm) four times daily for 5 to 7 days</td>
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<td><strong>OR</strong></td>
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<tr>
<td><strong>Trimethoprim-polymyxin B 0.1%-10,000 units/mL ophthalmic drops</strong></td>
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</tr>
<tr>
<td><strong>Ofloxacin 0.3% ophthalmic drops (preferred agent in contact lens wearer)</strong></td>
<td>1 to 2 drops four times daily for 5 to 7 days</td>
</tr>
<tr>
<td><strong>OR</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Ciprofloxacin 0.3% ophthalmic drops (preferred agent in contact lens wearer)</strong></td>
<td>1 to 2 drops four times daily for 5 to 7 days</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Specific approach</th>
<th>Dose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bacterial conjunctivitis</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Erythromycin 5 mg/gram ophthalmic ointment</strong></td>
<td>One-half inch (1.25 cm) four times daily for 5 to 7 days</td>
</tr>
<tr>
<td><strong>OR</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Trimethoprim-polymyxin B 0.1%-10,000 units/mL ophthalmic drops</strong></td>
<td>1 to 2 drops four times daily for 5 to 7 days</td>
</tr>
<tr>
<td><strong>OR</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Bacitracin-polymyxin B 500 units-10,000 units/gram ophthalmic ointment</strong></td>
<td>One-half inch (1.25 cm) four to six times daily for 5 to 7 days</td>
</tr>
<tr>
<td><strong>OR</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Bacitracin 500 units/gram ophthalmic ointment</strong></td>
<td>One-half inch (1.25 cm) four to six times daily for 5 to 7 days</td>
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<td><strong>Ofloxacin 0.3% (preferred agent in contact lens wearers)</strong></td>
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<td><strong>Ciprofloxacin 0.3% ophthalmic drops (preferred agent in contact lens wearer)</strong></td>
<td>1 to 2 drops four times daily for 5 to 7 days</td>
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<td><strong>OR</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Azithromycin 1% ophthalmic drops</strong></td>
<td>1 drop twice a day for 2 days; then 1 drop daily for 5 days</td>
</tr>
</tbody>
</table>

**Viral conjunctivitis**
<table>
<thead>
<tr>
<th>Condition</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Allergic conjunctivitis</strong></td>
<td>Antihistamine/decongestant drops (OTC): 1 to 2 drops four times daily as needed for no more than three weeks</td>
</tr>
<tr>
<td>Mast cell stabilizer/antihistamine drops</td>
<td>Generally, 1 to 2 drops one to three times daily (regimens vary by medication)</td>
</tr>
<tr>
<td><strong>Non-specific conjunctivitis</strong></td>
<td>Eye lubricant drops (OTC): 1 to 2 drops every 1 to 6 hours as needed</td>
</tr>
<tr>
<td><strong>AND/OR</strong></td>
<td>Eye lubricant ointment (OTC): One-half inch (1.25 cm) at bedtime or four times daily as needed</td>
</tr>
</tbody>
</table>

**OTC**: over-the-counter (available without a prescription in the United States).