



# Clinical Evaluation of Red Eyes in Pediatric Patients

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## ABSTRACT

Patients with the primary symptom of a red eye are commonly seen in pediatric primary care clinics. The differential diagnoses of a red eye are broad, but with a succinct history and physical examination, the diagnosis can be readily identified in many patients. Identifying conditions that threaten vision and understanding the urgency of referral to an ophthalmologist is paramount. Some systemic diseases such as leukemia, sarcoidosis, and juvenile idiopathic arthritis can present with the chief symptom of a red eye. Finally, trauma, ranging from mild to severe, often precipitates an office visit with a red eye, and thus understanding the signs that raise concern for a ruptured globe is essential. In the primary care setting, with a focused history, a few simple examination techniques, and an appreciation of the differential diagnosis, one can feel confident in managing patients with acute red eyes. *J Pediatr Health Care.* (2016) 30, 506-514.

## KEY WORDS

Red eye, conjunctivitis, pediatric, corneal abrasion

Patients with the primary symptom of a red eye are often seen in the pediatric primary care setting, and because the differential diagnoses are broad, the

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diagnosis can sometimes be elusive. However, with use of a focused history and simple clinical examination techniques, the provider can be more confident in the diagnosis and management of red eyes in children. Clinic visits for red eyes are common; approximately 1% of all primary care office visits are due to conjunctivitis (Azari & Barney, 2013). The eye becomes red as a nonspecific reaction to any type of insult, including infection, allergy, trauma, dryness, or systemic inflammation. The redness stems from engorgement of the conjunctival vessels. In trauma and some types of infection, the redness can be caused by subconjunctival hemorrhages. The red eye has a broad differential diagnosis, but very often, a simple history and physical examination can help elucidate the diagnosis (Table).

## HISTORY

The importance of obtaining a detailed history when evaluating a patient with a red eye cannot be overstated. The following items in the history require a specific focus:

- Duration of symptoms
- Presence of pain or itching
- Photophobia
- History of trauma—high or low velocity
- History of similar episodes
- Previous treatment

## CONJUNCTIVITIS

Conjunctivitis is one of the most common ophthalmologic disorders encountered by pediatric primary care practitioners. The eye becomes red as a result of dilation of the conjunctival blood vessels, which is sometimes associated with discharge and edema. When edema accumulates under the conjunctiva, the conjunctiva begins to look “boggy”; this appearance is referred to as chemosis (Figure 1). It is important to examine the palpebral conjunctiva—that is, the portion that covers the inside of the eyelid—which can be seen by pulling down on the lower eyelid or everting the upper eyelid. A papillary or follicular reaction may be

**TABLE. Differential diagnosis of red eye in children**

| Diagnosis                  | Pain              | Itching   | Discharge | History   | Other symptoms                                 | Treatment   |
|----------------------------|-------------------|-----------|-----------|---|--|---|
| Conjunctivitis             |                   |           |           |   |  |   |
| Viral                      | Burning sensation | No        | Tearing   | Positive for contact with sick people                           | Enlarged preauricular lymph node               | Conservative; contagious for 10-21 days   |
| Allergic                   | No                | Yes       | Tearing   | May have other allergy symptoms                                 | Allergic shiners                               | Artificial tears; oral antihistamines; mast cell stabilizer/antihistamine drops                         |
| Bacterial                  | Yes               | No        | Copious   | Unilateral or bilateral   |  | Antibiotic eyedrops   |
| Blepharitis                | Burning sensation | Sometimes | No        | Chronic crusting; chalazion; common in children aged 6-10 years | Eye discomfort that is worse in the afternoons | Eyelid washes, warm compresses  |
| Episcleritis               | Prominent         | No        | Tearing   | Occurs most often in older children/adolescents                 | May be associated with autoimmune disease      | NSAIDs; refer to ophthalmologist  |
| Scleritis                  | Severe            | No        | Tearing   | Connective tissue disease                                       | Vision loss, blue hue to sclera                | Refer to ophthalmologist  |
| Uveitis                    | Usually severe    | No        | Tearing   | Unilateral or bilateral   | Photophobia, decreased vision                  | Refer to ophthalmologist  |
| Trauma                     |                   |           |           |   |  |   |
| Corneal abrasion           | Moderate          | No        | Tearing   | Common in contact lens wearers                                  | Photophobia, pain with blinking                | Fluorescein examination, topical antibiotic drops; no use of contact lenses until the abrasion resolves |
| Foreign body               | Variable          | No        | Tearing   | High-velocity projectile vs low-velocity objects                | Pain with blinking                             | Refer to ED or ophthalmologist  |
| Subconjunctival hemorrhage | None              | No        | No        | Blunt trauma, cough, Valsalva maneuver                          | None   | No treatment needed   |
| Hyphema                    | Moderate          | No        | No        | Blunt trauma  | Photophobia                                    | Refer to ophthalmologist  |
| Ruptured globe             | Severe            | No        | No        | Penetrating trauma  | Decreased vision                               | Refer to ED, keep NPO   |

Note. ED, emergency department; NPO, nothing by mouth; NSAIDs, nonsteroidal anti-inflammatory drugs.

**FIGURE 1. Chemosis—edema of the conjunctiva.**

Photo courtesy of Phuchong Choksamai.  
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observed, depending on the underlying cause of the conjunctivitis. A papillary reaction creates large, flat nodules with a central vessel that is commonly described as “cobblestoning.” A follicular reaction creates smaller, dome-shaped, gelatinous-appearing lesions that are best seen on the palpebral conjunctiva (Figure 2). Conjunctivitis can be caused by viral or bacterial infections, allergies, or chemical exposure; viruses and allergies are the most commonly encountered causes.

### Viral Conjunctivitis

#### Definition

Viral conjunctival infection is most commonly caused by adenovirus types 8, 19, and 37 (LaMattina & Thompson, 2014). Some common variants of the classic viral conjunctivitis are pharyngoconjunctival fever and acute hemorrhagic conjunctivitis.

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