

**Eye Care Skills: Presentations for Physicians  
and Other Health Care Professionals Version 3.0**

# **Managing the Red Eye**

**Speaker Notes**

**Karla J. Johns, MD**  
**Executive Editor**

 **AMERICAN ACADEMY  
OF OPHTHALMOLOGY**  
*The Eye M.D. Association*

**Developed by**

Sue Ellen Young, MD,  
in conjunction with the Ophthalmology Liaisons  
Committee of the American Academy of  
Ophthalmology

**Reviewer, 2009 Revision**

Miriam T. Light, MD

**Executive Editor, 2009 Revision**

Karla J. Johns, MD

**Ophthalmology Liaisons Committee**

Carla J. Siegfried, MD, *Chair*

Donna M. Applegate, COT

James W. Gigantelli, MD, FACS

Kate Goldblum, RN

Karla J. Johns, MD

Miriam T. Light, MD

Mary A. O'Hara, MD

Judy Petrunak, CO, COT

David Sarraf, MD

Samuel P. Solish, MD

Kerry D. Solomon, MD

The Academy gratefully acknowledges the contributions of numerous past reviewers and advisory committee members who have played a role in the development of previous editions of the Eye Care Skills slide-script.

**Academy Staff**

Richard A. Zorab

*Vice President, Ophthalmic Knowledge*

Barbara Solomon

*Director of CME, Programs & Acquisitions*

Susan R. Keller

*Program Manager, Ophthalmology Liaisons*

Laura A. Ryan

*Editor*

Debra Marchi

*Permissions*

The authors state that they have no significant financial or other relationship with the manufacturer of any commercial product or provider of any commercial service discussed in the material they contributed to this publication or with the manufacturer or provider of any competing product or service.

The American Academy of Ophthalmology provides this material for educational purposes only. It is not intended to represent the only or best method or procedure in every case, or to replace a physician's own judgment or to provide specific advice for case management. Including all indications, contraindications, side effects, and alternative agents for each drug or treatment is beyond the scope of this material. All information and recommendations should be verified, prior to use, using current information included in the manufacturer's package inserts or other independent sources, and considered in light of the patient's condition and history. Reference to certain drugs, instruments, and other products in this publication is made for illustrative purposes only and is not intended to constitute an endorsement of such. Some materials may include information on applications that are not considered community standard that reflect indications not included in approved FDA labeling, or that are approved for use only in restricted research settings. The FDA has stated that it is the responsibility of the physician to determine the FDA status of each drug or device he or she wishes to use, and to use them with appropriate patient consent in compliance with applicable law. The Academy specifically disclaims any and all liability for injury or other damages of any kind, from negligence or otherwise, for any and all claims that may arise from the use of any recommendations or other information contained herein.

Slides 12 and 24 are reprinted, with permission, from Carr T, *Ophthalmic Medical Assisting*, 3rd Edition, San Francisco: American Academy of Ophthalmology; 2002.

Slide 48 is published courtesy of W. K. Kellogg Eye Center, University of Michigan.

Slides 66 and 73 are reprinted, with permission, from Sutphin JE, *Basic and Clinical Science Course: Section 8: External Disease and Cornea*, San Francisco: American Academy of Ophthalmology; 2005.

Slide 68 is reprinted, with permission, from Trobe JD, *The Physician's Guide to Eye Care*, 2nd Edition, San Francisco: American Academy of Ophthalmology; 2001.

Slides 69 and 70 are reprinted, with permission, from Simon JW, *Basic and Clinical Science Course: Section 6: Pediatric Ophthalmology and Strabismus*, San Francisco: American Academy of Ophthalmology; 2005.

Slide 78 is reprinted, with permission, from Moorthy RS, *Basic and Clinical Science Course: Section 8: Uveitis*, San Francisco: American Academy of Ophthalmology; 2005.

Slides 80 and 81 are reprinted, with permission, from Simmons ST, *Basic and Clinical Science Course: Section 10: Glaucoma*, San Francisco: American Academy of Ophthalmology; 2005.

# CONTENTS

<b>A GUIDE TO PRESENTING <i>MANAGING THE RED EYE</i></b> .....	<b>3</b>
<b>INTRODUCTION</b> .....	<b>4</b>
<b>EVALUATION</b> .....	<b>5</b>
<b>DISORDERS OF THE OCULAR ADNEXA</b> .....	<b>8</b>
Hordeolum and Chalazion .....	8
Blepharitis.....	10
Cellulitis 11	
<b>LACRIMAL SYSTEM DISORDERS</b> .....	<b>13</b>
Nasolacrimal Duct Obstruction .....	14
<b>OCULAR SURFACE DISORDERS</b> .....	<b>15</b>
Conjunctival/Scleral Anatomy.....	15
Conjunctivitis.....	16
Bacterial Conjunctivitis .....	17
Viral Conjunctivitis.....	18
Allergic Conjunctivitis.....	19
Neonatal Conjunctivitis .....	19
Subconjunctival Hemorrhage .....	21
Dry Eyes .....	21
Exposure Keratitis.....	23
Pinguecula/Pterygium.....	23
<b>ANTERIOR SEGMENT DISORDERS</b> .....	<b>24</b>
Corneal Anatomy, Symptoms, and Examination.....	25
Corneal Abrasion .....	27
Chemical Burns.....	29
Contact Lens Overwear .....	30
Infectious Keratitis.....	30
Bacterial Keratitis .....	31
Viral Keratitis .....	31
Hyphema.....	33
Inflammatory Conditions.....	33
Acute Angle-Closure Glaucoma.....	35
<b>SUMMARY</b> .....	<b>37</b>
<b>APPENDIX 1: COMMON RED EYE DISORDERS: DIAGNOSIS AND MANAGEMENT...</b>	<b>39</b>
<b>APPENDIX 2: THE RED EYE: DIFFERENTIAL DIAGNOSIS</b> .....	<b>44</b>
<b>APPENDIX 3: RESOURCES</b> .....	<b>45</b>

# **A GUIDE TO PRESENTING**

## **Managing the Red Eye**

*Managing the Red Eye* introduces the primary care physician to skills useful in evaluating the red eye and provides a practical clinical approach to diagnosis and treatment of many common red eye disorders. Additionally, the audience will learn how to recognize more serious, vision-threatening red eye disorders for prompt referral to an ophthalmologist.

The program takes an anatomic approach to common red eye disorders and their management. Normal anatomy is reviewed as it relates to the pathophysiology of common diseases that contribute to the red eye. Included are disorders of the ocular adnexa (lids, orbit), lacrimal system, ocular surface (conjunctiva and sclera), and anterior segment (cornea and anterior chamber). Key concepts, such as side effects of topical steroids, and management for such emergent red-eye conditions as cellulitis, chemical burns, and acute angle-closure glaucoma are presented.

### **Approximate Running Time**

50 to 90 minutes

### **Suggested Audience**

- Family physicians
- Emergency physicians
- Internists
- Pediatricians
- Medical students, interns, residents
- Emergency-room personnel (non-MD)
- State and local meetings of national medical societies, AAFP, AAP, ACP, ACEP

# INTRODUCTION

SLIDE

1

Physicians frequently encounter patients who complain of a red eye. This slide program provides an approach to differential diagnosis of conditions that can cause a red eye, helping physicians understand which conditions causing a red eye require immediate treatment, which may wait a few days, and which do not require treatment.

SLIDE

2

All subjective ocular complaints fall into three categories of symptoms: decreased vision, pain, and redness. Different types of decreased vision can be blurred vision from a foreign body disrupting the corneal surface or a dark haze that might come from a hyphema. With a careful history, different kinds of pain can be elicited, such as photophobia from corneal edema resulting from angle closure glaucoma or uveitis, foreign body sensation from an abrasion, or deep boring pain from scleritis or severe uveitis. Careful examination will show if the redness is unilateral, localized, or involves the lids. Eyelid disorders frequently bring patients with a red eye to the doctor, and so the lids should be considered as part of a systematic evaluation of ocular complaints.

SLIDE

3

Redness of the eyes and lids is caused by three types of problems: Mechanical trauma such as a foreign body or abrasion, chemical trauma such as an acid or alkali burn, and infection/inflammation, such as a corneal ulcer or uveitis.

Introduction

## DIFFERENTIATE RED EYE DISORDERS

- Needs immediate treatment
- Needs treatment within a few days
- Does not require treatment



Introduction

## SUBJECTIVE EYE COMPLAINTS

- Decreased vision
- Pain
- Redness

Characterize the complaint through history and exam.

Introduction

## TYPES OF RED EYE DISORDERS

- Mechanical trauma
- Chemical trauma
- Inflammation/infection

In order of urgency, the conditions that cause most red eye complaints are (1) chemical injury, (2) angle-closure glaucoma, (3) ocular foreign body, (4) corneal abrasion, (5) uveitis, (6) conjunctivitis, (7) ocular surface disease, and (8) subconjunctival hemorrhage. There may be different subsets in each category; for instance, conjunctivitis may be bacterial, viral, or allergic. Ocular surface disease may be an ectropion causing exposure, dry eyes, or an inflamed pinguecula. Some entities may cross categories: an infection early on may be bacterial conjunctivitis with minimal discomfort, but if it becomes a corneal ulcer it will initially feel like a foreign body. If it advances to endophthalmitis, it will cause severe uveitis-like pain.

## ETIOLOGIES OF RED EYE

- Chemical injury
- Angle-closure glaucoma
- Ocular foreign body
- Corneal abrasion
- Uveitis
- Conjunctivitis
- Ocular surface disease
- Subconjunctival hemorrhage

## EVALUATION

A systematic diagnostic approach to the patient with a red eye will help the physician reach a differential diagnosis that will include most of the causes of a red eye. As with any diagnostic problem, the information obtained from a careful history and examination should direct the approach to management. The “redness” in a red eye usually comes from dilated conjunctival blood vessels (the sclera is less vascular), as in the case of “pink eye,” or, rarely, torn blood vessels, which may exude bright red blood in a subconjunctival hemorrhage. The onset of a red eye, duration, and clinical course should be recorded to help distinguish the causative agent: trauma, chemicals, infection, allergy, or systemic conditions.

## RED EYE: POSSIBLE CAUSES

- Trauma
- Chemicals
- Infection
- Allergy
- Systemic conditions

SLIDE

6

Specific symptoms may reveal the cause of the red eye. For example, itching typically signifies allergies. A burning sensation suggests lid, conjunctival, or tear film disorders, or corneal abrasions or foreign bodies. A foreign-body sensation might signify an embedded foreign body, a corneal abrasion, or an inturned eyelash. Localized lid pain or tenderness in the lids is a common presenting complaint of a hordeolum or an acute chalazion.

SLIDE

7

Deep, intense, aching pain that is not localized may reflect a large corneal abrasion, scleritis, iritis or acute glaucoma. Photophobia, pain when exposed to bright light, is caused by ciliary body muscle spasm, and indicates problems arising from the anterior segment of the eye, such as corneal abrasions, iritis, and acute glaucoma. A halo seen around a light is caused by corneal edema, seen in acute glaucoma and uveitis. Halo vision without pain can also be seen in contact lens overwear and cataracts.

SLIDE

8

To evaluate the red eye, the primary care physician needs a visual acuity chart, a penlight with a blue filter, fluorescein dye, and topical anesthetic drops.

RED EYE: CAUSE AND EFFECT

Symptom	Cause
Itching	Allergy
Burning	Lid disorders, dry eye
Foreign body sensation	Foreign body, corneal abrasion
Localized lid tenderness	Hordeolum, chalazion

RED EYE: CAUSE AND EFFECT  
(Continued)

Symptom	Cause
Deep, intense pain	Corneal abrasions, scleritis, iritis, acute glaucoma, sinusitis, etc.
Photophobia	Corneal abrasions, iritis, acute glaucoma
Halo vision	Corneal edema (acute glaucoma, uveitis)



Equipment needed to evaluate red eye

## SLIDE

## 9

The examination should begin with a visual acuity recording. A Snellen chart at 20 feet should be available in most offices, but a near vision card can be used. For young children, an eye chart using pictures can be used. Patients who wear eyeglasses or contact lenses should wear them for testing if possible. Remember that a patient over 40 years of age with good distance vision probably still needs reading glasses for near vision.

A red eye with decreased vision could signal a vision-threatening disorder. In general, red eyes with no vision loss can usually be treated by family physicians, but red eyes with any vision compromise should be referred where possible to an ophthalmologist.

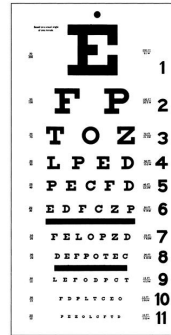
## SLIDE

## 10

After visual acuity is checked, systematic examination of the eye and adnexa should then be conducted, starting anteriorly with the face and lids and moving posteriorly to globe. The face, orbital area, and lids are inspected first, then the ocular movements, and finally the globe itself. A slit-lamp biomicroscope is essential for examination of the anterior chamber, although careful scrutiny of the cornea with a penlight can yield a wealth of information.

Similarly, a tonometer (Schiotz, applanation, or TonoPen) to check intraocular pressure is the easiest way to rule out angle closure glaucoma, but a careful history and penlight exam can elicit the possibility of that condition.

## Evaluation



Refer red eye with vision loss to ophthalmologist for evaluation

## Evaluation

### RED EYE DISORDERS: AN ANATOMIC APPROACH

- Face
- Adnexa
  - Orbital area
  - Lids
  - Ocular movements
- Globe
  - Conjunctiva, sclera
  - Anterior chamber (using slit lamp if possible)
  - Intraocular pressure



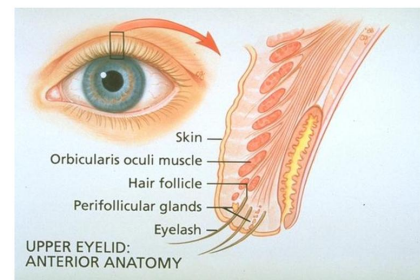
# DISORDERS OF THE OCULAR ADNEXA

SLIDE

11

A number of conditions cause redness of the ocular adnexa, although they may not actually cause the eye itself to become red. These conditions are discussed here because many lid problems are intricately connected to ocular surface disease and infections. Most of these conditions can be easily diagnosed and managed in the office. A cross-sectional view of the normal eyelid demonstrates anatomy pertinent to these disease entities. Anteriorly, note the skin, muscle, eyelashes, and perifollicular glands.

Disorders of the Ocular Adnexa



## Hordeolum and Chalazion

SLIDE

12

Surrounding the follicles at the base of the eyelashes are oil glands, which, when obstructed, produce a hordeolum, or sty. A hordeolum may look like a pimple and develops near the skin surface on the anterior margin of the lid, adjacent to the cilia. Hordeola with swelling only are *usually not* infected, although redness and discomfort may be signs of infection.

Disorders of the Ocular Adnexa



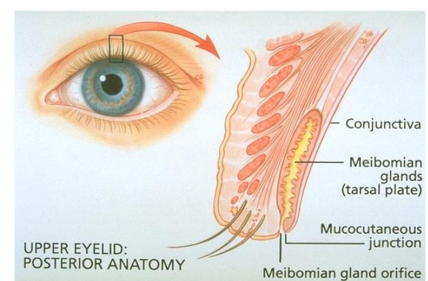
Hordeolum

SLIDE

13

The meibomian gland is a sebaceous gland that secretes the oily component of tears. There are approximately 30 to 40 vertically oriented meibomian glands across a normal lid. The meibomian glands are in the posterior aspect of the lid, behind the orbital septum and just in front of the cartilage tarsal plate, which provides support for the lids.

Disorders of the Ocular Adnexa



The meibomian glands drain through small opening on the posterior edge of the lid margin. When obstructed, these glands may produce a tender, red swelling in the adjacent lid tissue called a chalazion.



Chalazion

Treatment of a hordeolum or chalazion is aimed at promoting drainage of these inflamed glands. Hot compresses (warmer than lukewarm but not so hot that they burn) applied to the affected lid area externally for 10 minutes, 3 times daily, are highly effective for acute or subacute lesions. Compresses may have to be continued for several weeks until the condition is resolved. Because both conditions are usually sterile, topical antibiotics are usually unnecessary. Should a chalazion become a chronic, nontender, localized mass, drainage is achieved by incision and curettage by an ophthalmologist. Systemic antibiotics are usually not indicated for these localized lid disorders unless diffuse cellulitis also is present.

### HORDEOLUM/CHALAZION: TREATMENT

- Goal
  - To promote drainage
- Treatment
  - Acute/subacute: Warm-hot compresses, tid
  - Chronic: Refer to ophthalmologist

# Blepharitis

SLIDE

16

Blepharitis is a chronic eyelid inflammation affecting the eyelashes and the glands surrounding the eyelashes, and sometimes associated with dry eyes. Seborrhea is noted as collarettes of dried skin and wax around the base of the lashes of the upper and lower lids. Associated localized redness may be caused by Staphylococcal infection. Typically, a patient complains of burning, matting of the lashes, and eyelids sticking together upon awakening, but patients also may be asymptomatic.

SLIDE

17

This slide shows collarettes of dried skin and wax at the base of the eyelashes in a patient with blepharitis. Frequently seborrhea of the scalp, eyebrows, ears, and face is noticeable, and rosacea of the face may be present.

Disorders of the Ocular Adnexa

## BLEPHARITIS

- Inflammation of lid margin
- Associated with dry eyes
- Seborrhea causes dried skin and wax on base of lashes
- May have Staphylococcal infection
- Symptoms: lid burning, lash matting

Disorders of the Ocular Adnexa



Collarettes on eyelashes of patient with blepharitis

Treatment of blepharitis is directed toward proper face and lid hygiene. Instruct the patient to use hot compresses to loosen the crusting and to cleanse the lashes twice daily with a washcloth, cotton-tipped swabs moistened with nonirritating shampoo (such as a baby shampoo) diluted with water, or commercially available over-the-counter eye scrub pads. Other treatment options include applying antibiotic ointment, such as erythromycin, to the lids, or applying an antibiotic-steroid ointment, such as Tobradex or Blephamide. The combination antibiotic-steroid ointments can reduce inflammation in conjunction with other treatments. Oral doxycycline (Vibramycin 100 mg daily for 1 month) is helpful in treating refractory cases by changing the nature of the secretions produced by the meibomian glands.

## BLEPHARITIS: TREATMENT

- Lid and face hygiene
  - Warm compresses to loosen deposits on lid margin
  - Gentle scrubbing with nonirritating shampoo or scrub pads
- Artificial tears to alleviate dry eye
- Antibiotic or antibiotic-corticosteroid ointment
- Oral doxycycline 100 mg daily for refractory cases

## Cellulitis

Cellulitis anterior to the orbital septum presents as edema and erythema of the lids. The lids are often tender to the touch. The edema may be so severe that the lids are swollen shut. In cases of anterior (periorbital or preseptal) cellulitis, the visual acuity, pupils, and mobility are normal, and there is no proptosis. These cases should be treated with systemic antibiotics and warm compresses. A CT scan should be considered if there are concerns that the orbit is involved or if the condition fails to respond promptly to antibiotic therapy.



Preseptal cellulitis











































































