Blepharitis
Limited Revision
Prepared by the American Academy of Ophthalmology Cornea/External Disease Panel

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As a service to its members and the public, the American Academy of Ophthalmology has developed a series of clinical practice guidelines called Preferred Practice Patterns that identify characteristics and components of quality eye care. Appendix 1 describes the core criteria of quality eye care.

The Preferred Practice Pattern® (PPP) guidelines are based on the best available scientific data as interpreted by panels of knowledgeable health professionals. In some instances, such as when results of carefully conducted clinical trials are available, the data are particularly persuasive and provide clear guidance. In other instances, the panels have to rely on their collective judgment and evaluation of available evidence.

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All PPPs are reviewed by their parent panel annually or earlier if developments warrant and updated accordingly. To ensure that all PPPs are current, each is valid for 5 years from the “approved by” date unless superseded by a revision. Preferred Practice Pattern guidelines are funded by the Academy without commercial support. Authors and reviewers of PPPs are volunteers and do not receive any financial compensation for their contributions to the documents. The PPPs are externally reviewed by experts and stakeholders before publication.

The intended users of the Blepharitis Preferred Practice Pattern guideline are ophthalmologists.
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INTRODUCTION

The Preferred Practice Pattern® (PPP) guidelines have been written on the basis of three principles.

- Each Preferred Practice Pattern should be clinically relevant and specific enough to provide useful information to practitioners.
- Each recommendation that is made should be given an explicit rating that shows its importance to the care process.
- Each recommendation should also be given an explicit rating that shows the strength of evidence that supports the recommendation and reflects the best evidence available.

In the process of revising this document, a detailed literature search of articles in the English language was conducted in December 2007 in PubMed and in the Cochrane Library on the subject of blepharitis for the years 2002 to 2007. To complete this limited revision, PubMed and the Cochrane Library were searched on January 26, January 27, and February 11, 2011 on the subject of blepharitis, limited to English language and publication date of 2008 to the date of the search. Details of the literature search are available at www.aao.org/ppp. The results were reviewed by the Cornea/External Disease Panel and used to prepare the recommendations, which they rated in two ways.

The panel first rated each recommendation according to its importance to the care process. This “importance to the care process” rating represents care that the panel thought would improve the quality of the patient’s care in a meaningful way. The ratings of importance are divided into three levels.

- Level A, defined as most important
- Level B, defined as moderately important
- Level C, defined as relevant but not critical

The panel also rated each recommendation on the strength of evidence in the available literature to support the recommendation made. The “ratings of strength of evidence” also are divided into three levels.

- Level I includes evidence obtained from at least one properly conducted, well-designed, randomized, controlled trial. It could include meta-analyses of randomized controlled trials.
- Level II includes evidence obtained from the following:
  - Well-designed controlled trials without randomization
  - Well-designed cohort or case-control analytic studies, preferably from more than one center
  - Multiple-time series with or without the intervention
- Level III includes evidence obtained from one of the following:
  - Descriptive studies
  - Case reports
  - Reports of expert committees/organizations (e.g., PPP panel consensus with external peer review)

The evidence cited is that which supports the value of the recommendation as something that should be performed to improve the quality of care. The committee believes that it is important to make available the strength of the evidence underlying the recommendation. In this way, readers can appreciate the degree of importance the committee attached to each recommendation and they can understand what type of evidence supports the recommendation.

The ratings of importance and the ratings of strength of evidence are given in bracketed superscripts after each recommendation. For instance, “[A:II]” indicates a recommendation with high importance to clinical care [A], supported by sufficiently rigorous published evidence, though not by a randomized controlled trial [II].

The sections entitled Orientation and Background do not include recommendations; rather they are designed to educate and provide summary background information and rationale for the recommendations that are presented in the Care Process section. A summary of the major recommendations for care is included in Appendix 2.
ORIENTATION

ENTITY
Blepharitis, which may include entities with the following ICD-9 classifications:
- Blepharitis, unspecified (373.00)
- Ulcerative (373.01)
- Angular (373.01)
- Squamous (373.02)
- Stye (373.11)
- Meibomitis (373.12)
- Abscess of eyelid (373.13)
- Parasitic infestation of eyelid (373.60)

DISEASE DEFINITION
This Preferred Practice Pattern focuses on chronic blepharitis, which is a chronic ocular inflammation that involves the eyelid margin primarily and is a common cause of chronic ocular irritation.

ACTIVITY
Diagnosis and management of the patient with blepharitis.

PATIENT POPULATION
The patient population includes individuals of all ages who present with symptoms and signs suggestive of blepharitis, such as eyelid and ocular irritation and redness.

PURPOSE
The purpose of diagnosing and managing blepharitis is to preserve visual function, to minimize structural damage to the eyelids and ocular surface, and to improve patient comfort and appearance.

GOALS
- Establish the diagnosis of blepharitis, differentiating it from other causes of irritation and redness
- Identify the type of blepharitis
- Establish appropriate therapy
- Relieve discomfort and pain
- Prevent complications
- Educate and engage the patient in the management of this potentially chronic disease

BACKGROUND
Blepharitis can be classified according to anatomic location: anterior blepharitis affects the base of the eyelashes and the eyelash follicles, and posterior blepharitis affects the meibomian glands and gland orifices. Blepharitis has traditionally been clinically subcategorized as staphylococcal, seborrheic, meibomian gland dysfunction (MGD), or a combination thereof. Staphylococcal and seborrheic blepharitis involve mainly the anterior eyelid and can each be referred to as anterior blepharitis. Meibomian gland dysfunction involves the posterior eyelid margin. This Preferred Practice Pattern covers these three subcategories of chronic blepharitis.
There is considerable overlap of symptoms of all types of blepharitis. Blepharitis frequently leads to associated ocular surface inflammation, including conjunctivitis, functional tear deficiency, and keratitis. Blepharitis may also exacerbate symptoms of coexisting ocular surface disease, including allergy and aqueous tear deficiency (keratoconjunctivitis sicca, or KCS). The chronic nature of blepharitis, the uncertain etiology, and the frequent coexistence of ocular surface disease make blepharitis difficult to manage.

Staphylococcal blepharitis is characterized by scaling, crusting, and erythema of the eyelid margin with collarette formation at the base of the cilia. Chronic inflammation may be punctuated by acute exacerbations that lead to the development of ulcerative blepharitis. Loss of eyelashes and corneal involvement, including punctate epithelial erosions, neovascularization, and marginal infiltrates, may occur.

Although *Staphylococcus epidermidis* is isolated with great frequency (in 89% to 100% of cases) from eyelids of both normal subjects and patients with blepharitis, *Staphylococcus aureus* is isolated with greater frequency from eyelids of patients with clinical diagnoses of staphylococcal blepharitis. Both *S. epidermidis* and *S. aureus* are believed to play a role in the development of staphylococcal blepharitis, but the mechanisms of disease production remain poorly understood. Toxin production has been reported to correlate with the presence of blepharoconjunctivitis; however, other investigators have found no correlation between toxin production of *S. aureus* isolates and the presence of clinical disease. Immunologic mechanisms have been documented. Enhanced cell-mediated immunity to *S. aureus* has been detected in 40% of patients with chronic blepharitis but not among normal subjects. Cell-mediated immunologic mechanisms have also been implicated in the development of keratitis associated with staphylococcal blepharitis. Staphylococcal antigens themselves can initiate an inflammatory reaction by attaching to bacterial antigen-binding receptors that are present on the corneal epithelium.

Patients with seborrheic blepharitis have greasy scaling of the anterior eyelid, and they frequently have seborrheic dermatitis of the eyebrows and scalp as well.

Eyelid manifestations of MGD include prominent blood vessels crossing the mucocutaneous junction, frothy discharge along the eyelid margin, plugging or plugging of meibomian orifices, expression of meibomian secretions that range from turbid fluid to thick cheese-like material, thickening and scalloping of the eyelid margin, and chalazion. These changes can lead to eventual atrophy of meibomian glands. Patients with MGD frequently are noted to have coexisting rosacea or seborrheic dermatitis. Alterations in the biochemical composition of meibomian gland secretions have been documented in patients with MGD blepharitis when compared with normal subjects.

**EPIDEMIOLOGY**

Although blepharitis is one of the most common ocular disorders, epidemiological information on its incidence or prevalence within defined populations is lacking. One single-center study of 90 patients with chronic blepharitis noted that the mean age of patients was 50 years. Compared with patients with other forms of blepharitis, patients with staphylococcal blepharitis were found to be relatively younger (42 years old) and most were female (80%).

**ASSOCIATED CONDITIONS AND CAUSES OF BLEPHARITIS**

Keratoconjunctivitis sicca has been reported to be present in 50% of patients with staphylococcal blepharitis. Conversely, in a series of 66 patients with KCS, 75% had staphylococcal conjunctivitis or blepharitis. It is possible that a decrease in local lysozyme and immunoglobulin levels associated with tear deficiency may alter resistance to bacteria, predisposing to the development of staphylococcal blepharitis.

Twenty-five to 40% of patients with seborrheic blepharitis and MGD, and 37% to 52% of patients with ocular rosacea have aqueous tear deficiency. This may result from increased tear-film evaporation due to a deficiency in the lipid component of the tears as well as reduced ocular-surface sensation. Low levels of tear-film phospholipids have been found to correlate with the presence
of KCS in patients with chronic blepharitis.\textsuperscript{14} Rosacea (see definition below) is associated with epithelial basement-membrane abnormalities and recurrent corneal epithelial erosions.\textsuperscript{15, 16} Fluorescein tear breakup time is significantly shorter in patients with MGD, even if aqueous tear production is normal.\textsuperscript{17} This suggests that meibomian gland secretions are important in maintaining a stable precocular tear film. The overlap of clinical features of the various forms of chronic blepharitis and the variable association of all forms with tear dysfunction\textsuperscript{1} underscores the complexity of the relationship between blepharitis and tear dysfunction as well as the need for customized treatment approaches for patients with complaints of ocular irritation.

Dermatologic conditions associated with seborrheic blepharitis and MGD may share common etiologies and predisposing factors. In one study, 95% of patients with seborrheic blepharitis also had seborrheic dermatitis.\textsuperscript{1} In patients with a subset of MGD called primary (diffuse) meibomitis, 74% had a seborrheic dermatitis and 51% had rosacea (acne rosacea).\textsuperscript{1} Demodex folliculorum has been found in 30% of patients with chronic blepharitis, but it has also been found with nearly the same prevalence in patients without blepharitis.\textsuperscript{18} However, patients with recalcitrant blepharitis have responded to therapy directed at eradication of the Demodex mites.\textsuperscript{18}

Rosacea is a disease of the skin and eye that is observed more frequently in fair-skinned individuals,\textsuperscript{19} but it can occur in people of all races. Characteristic facial skin findings include erythema, telangiectasia, papules, pustules, prominent sebaceous glands, and rhinophyma. Rosacea may be difficult to diagnose in patients with darker skin tones because of the difficulty in visualizing telangiectasia or facial flushing. Rosacea is typically seen in middle age and occurs more often in women.\textsuperscript{20} While rosacea is more prevalent in women, it can be more severe when it occurs in men.\textsuperscript{21, 22} Because many patients exhibit only mild signs, such as telangiectasia and a history of easy facial flushing, the diagnosis of rosacea is often overlooked, especially in children who may present with chronic recurrent keratoconjunctivitis, punctate erosions, keratitis, meibomian gland disease, or recurrent chalazia and have subtle signs of rosacea.\textsuperscript{23} Children with ocular rosacea often present with concomitant involvement, asymmetry of ocular disease, and the potential for sight-threatening visual impairment. Cutaneous rosacea is less frequent in children and associated atopy is common.\textsuperscript{23, 25} Children with a history of styes have an increased risk of developing adult rosacea.\textsuperscript{26} Isotretinoin, an oral medication that is used to treat severe cystic acne, is associated with a significant increase in colonization of the conjunctiva with \textit{S. aureus}, blepharitis, and a disruption in tear function.\textsuperscript{27} Discontinuation of the medication leads to improvement in most cases.\textsuperscript{27-30} Patients with contact-lens-associated giant papillary conjunctivitis have an increased frequency of MGD.\textsuperscript{31} The severity of giant papillary conjunctivitis may correlate with the severity of MGD.\textsuperscript{31} Table 1 lists other entities that produce inflammation of the eyelid margin.

**NATURAL HISTORY**

Blepharitis is a chronic condition that has periods of exacerbation and remission. Although onset usually occurs in middle-aged adults, it can begin in childhood.\textsuperscript{23, 32} Staphylococcal blepharitis may become less problematic with time. Severe staphylococcal blepharitis may eventually lead to eyelash loss, eyelid scarring with trichiasis, and corneal scarring and neovascularization.\textsuperscript{7} Patients with seborrheic blepharitis and MGD blepharitis are generally older and have a longer history of ocular symptoms (range 6.5 to 11.6 years).\textsuperscript{6} Eyelid margin telangiectasia and meibomian gland orifice narrowing and pouting may occur in asymptomatic older patients.\textsuperscript{23} Patients with severe ocular rosacea may develop superficial punctate keratopathy, corneal neovascularization, and scarring.\textsuperscript{19} Ulceration and perforation can occur rarely.
<table>
<thead>
<tr>
<th>Condition</th>
<th>Entity</th>
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<tr>
<td>Bacterial infections</td>
<td>Impetigo</td>
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<td>Erysipelas</td>
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<td>Viral infections</td>
<td>Herpes simplex virus</td>
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<td>Molluscum contagosum</td>
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<td>Varicella zoster virus</td>
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<td>Papillomavirus</td>
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<td>Vaccinia</td>
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<td>Parasitic infection</td>
<td>Pediculosis palpebranum (Pthirus pubis)</td>
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<td>Immunologic conditions</td>
<td>Atopic dermatitis</td>
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<td>Contact dermatitis</td>
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<td>Erythema multiforme</td>
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<td>Pemphigus foliaceus</td>
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<td>Mucous membrane pemphigoid</td>
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<td>Stevens-Johnson syndrome</td>
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<td>Connective tissue disorders</td>
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<td>Discoid lupus</td>
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<td>Exfoliative dermatitis</td>
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<td>Erythroderma</td>
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<td>Benign eyelid tumors</td>
<td>Pseudoepitheliomatous hyperplasia</td>
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<td>Actinic keratosis</td>
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<td>Squamous cell papilloma</td>
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<td>Sebaceous gland hyperplasia</td>
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<td>Pyogenic granuloma</td>
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<td>Malignant eyelid tumors</td>
<td>Basal cell carcinoma</td>
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<td>Squamous cell carcinoma</td>
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<td>Sebaceous gland carcinoma</td>
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<td>Melanoma</td>
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<td>Kaposi sarcoma</td>
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<td>Mycosis fungoides</td>
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<td>Trauma</td>
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<td>Toxic conditions</td>
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**EARLY DETECTION**

Early detection and appropriate treatment can reduce signs and symptoms of blepharitis and prevent permanent structural damage and possible vision loss. This is particularly important in children, in whom chronic blepharokeratoconjunctivitis is often unrecognized. It should be suspected in a child with recurrent conjunctivitis, keratitis, neovascularization, eyelid inflammation, hordeolae, and chalazia.  

Discoid lupus erythematosus can masquerade as blepharoconjunctivitis, and ulcerative blepharitis can be an early presentation of Crohn disease. Recognizing the association of eyelid inflammation with these systemic diseases can lead to prompt and effective treatment. In cases where carcinoma masquerades as blepharitis, early diagnosis and appropriate treatment can prevent disfigurement and may be lifesaving.
CARE PROCESS

PATIENT OUTCOME CRITERIA
Outcome criteria for managing blepharitis include the following:

- Reducing the symptoms and signs of blepharitis
- Minimizing structural damage
- Preventing loss of visual function

DIAGNOSIS
The initial evaluation of a patient with symptoms and signs suggestive of blepharitis should include the relevant aspects of the comprehensive medical eye evaluation. The diagnosis of blepharitis is usually based on a typical patient history and characteristic findings. Ancillary testing may be helpful.

Patient History
Questions about the following elements of the patient history may elicit helpful information:

- Symptoms and signs: redness, irritation, burning, tearing, itching, crusting of eyelashes, loss of eyelashes, eyelid sticking, contact lens intolerance, photophobia, increased frequency of blinking
- Time of day when symptoms are worse
- Duration of symptoms
- Unilateral or bilateral presentation
- Exacerbating conditions: smoke, allergens, wind, contact lenses, low humidity, retinoids, diet and alcohol consumption, eye makeup
- Symptoms and signs related to systemic diseases: rosacea, allergy
- Current and previous systemic and topical medications: antihistamines or drugs with anticholinergic effects, or drugs used in the past that might have an effect on the ocular surface (e.g., isotretinoin)
- Recent exposure to an infected individual: pediculosis palpebrarum (Pthirus pubis)

The ocular history may include details about previous intraocular and eyelid surgery, as well as local trauma, including mechanical, thermal, chemical, and radiation injury. A history of cosmetic blepharoplasty is important to obtain because it can make evaporative dry eye worse. A history of styes and/or chalazia is common.

The medical history may also include information about dermatological diseases such as rosacea, atopic disease, and herpes zoster ophthalmicus.

Examination
Examination of the eye and adnexa includes measurement of visual acuity, an external examination, slit-lamp biomicroscopy, and measurement of intraocular pressure. The external examination should be performed in a well-lighted room with particular attention to the following:

- Skin
  - Changes consistent with rosacea such as rhinophyma, erythema, telangiectasia, papules, pustules, and hypertrophic sebaceous glands in malar areas
  - Dermatitis
  - Rash
- Eyelids
  - Abnormal eyelid position (i.e., ectropion and entropion)
  - Loss, breakage, or misdirection of eyelashes
  - Vascularization or hyperemia of eyelid margins
  - Abnormal deposits at base of eyelashes
• Ulceration
• Vesicles
• Scaling, hyperkeratosis
• Chalazion/hordeolum
• Scarring
The slit-lamp biomicroscopy should include evaluation of the following:

◆ Tear film\[^{A;III}\]
  • Tear meniscus
  • Quality of mucus and lipid
  • Foamy discharge
  • Debris in the tear film
◆ Anterior eyelid margin\[^{A;III}\]
  • Hyperemia
  • Telangiectasia
  • Scarring
  • Pigmentary changes
  • Keratinization
  • Ulceration
  • Vesicles
  • Blood-tinged debris
  • Pediculosis palpebrarum (*Pthirus pubis*)
  • Presence of mass
◆ Eyelashes\[^{A;III}\]
  • Malposition or misdirection
  • Loss or breakage
  • Pediculosis palpebrarum (*Pthirus pubis*) nits
  • Encrustations such as cosmetic deposits and collarettes
◆ Posterior eyelid margin\[^{A;III}\]
  • Abnormalities of meibomian orifices such as capping, pouting, retroplacement, metaplasia, and obliteration\[^{39}\]
  • Character of meibomian secretions such as expressibility, thickness, turbidity, and color
  • Vascularization; keratinization; nodularity
  • Thickening
  • Scarring
◆ Tarsal conjunctiva (everting eyelids)\[^{A;III}\]
  • Appearance of meibomian glands and ducts such as dilation and inflammation
  • Chalazia
  • Erythema
  • Scarring
  • Keratinization
  • Papillary/follicular reaction
  • Lipid exudation/inspissation
◆ Bulbar conjunctiva\[^{A;III}\]
  • Hyperemia
  • Phlyctenules, follicles
  • Punctate staining\[^{C;III}\] with fluorescein, rose bengal, or lissamine green
◆ Cornea\[^{A;III}\]
  • Epithelial defect, punctate staining with fluorescein or rose bengal
  • Edema, infiltrates, ulcers, and/or scars
  • Vascularization, including pannus
  • Phlyctenules
Diagnostic Tests

There are no specific clinical diagnostic tests for blepharitis. However, cultures of the eyelid margins may be indicated for patients with recurrent anterior blepharitis with severe inflammation as well as for patients who are not responding to therapy. Microscopic evaluation of epilated eyelashes may reveal Demodex mites, which have been implicated in cases of chronic blepharoconjunctivitis. Demodex infestation is associated with cylindrical dandruff on the eyelashes and has been described in patients with MGD, conjunctival inflammation, and ocular rosacea. It has also been described in patients with corneal signs such as marginal infiltrate, phlyctenule, superficial vascularization, superficial opacities, and nodular scarring.

A biopsy of the eyelid may be indicated to exclude the possibility of carcinoma in cases of marked asymmetry, resistance to therapy, or unifocal recurrent chalazia that do not respond well to therapy. Additional signs of concern may include loss of normal eyelid margin and conjunctival anatomy, and focal madarosis. Before obtaining a biopsy for suspected sebaceous gland carcinoma, consultation with a pathologist is recommended to discuss the potential need for frozen sections and mapping of the conjunctiva to search for pagetoid spread. Fresh tissue may be needed to detect lipids using special dyes such as oil red-O.

Clinical features that may aid in the differential diagnosis of staphylococcal, seborrheic, and MGD blepharitis are summarized in Table 2. Clinical features of these forms of blepharitis often overlap, and patients with associated conditions such as dry eye syndrome can present with similar clinical features.

### TABLE 2 DESCRIPTION OF CLINICAL FEATURES OF BLEPHARITIS BY CATEGORY

<table>
<thead>
<tr>
<th>Feature</th>
<th>Anterior Eyelid</th>
<th>Posterior Eyelid</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Staphylococcal</td>
<td>Seborrheic</td>
</tr>
<tr>
<td>Eyelash loss</td>
<td>Frequent</td>
<td>Rare</td>
</tr>
<tr>
<td>Eyelash misdirection</td>
<td>Frequent</td>
<td>Rare</td>
</tr>
<tr>
<td>Eyelid deposits</td>
<td>Matted, hard scales/collarettes</td>
<td>Oily or greasy</td>
</tr>
<tr>
<td>Eyelid ulceration*</td>
<td>With severe exacerbations</td>
<td>(—)</td>
</tr>
<tr>
<td>Eyelid scarring</td>
<td>May occur</td>
<td>(—)</td>
</tr>
<tr>
<td>Chalazia</td>
<td>Rare</td>
<td>Rare</td>
</tr>
<tr>
<td>Hordeolum</td>
<td>May occur</td>
<td>(—)</td>
</tr>
<tr>
<td>Conjunctiva</td>
<td>Mild to moderate injection; phlyctenules may occur</td>
<td>Mild injection</td>
</tr>
<tr>
<td>Aqueous tear deficiency</td>
<td>Frequent</td>
<td>Frequent</td>
</tr>
<tr>
<td>Cornea</td>
<td>Inferior punctate epithelial erosions, peripheral/marginal infiltrates, scarring, neovascularization and pannus, thinning, phlyctenules (typically at 10, 2, 4, or 8 o’clock)</td>
<td>Inferior punctate epithelial erosions</td>
</tr>
<tr>
<td>Dermatologic disease</td>
<td>Atopy rarely</td>
<td>Seborrheic dermatitis</td>
</tr>
</tbody>
</table>

* Also consider herpes simplex virus.

NOTE: A dash in the column indicates that the feature is not found for the specific type of blepharitis.

TREATMENT

There is insufficient evidence to make definitive recommendations for the treatment of blepharitis, and the patient must understand that a cure is not possible in most cases. Treatments that are helpful include the following:

- Warm compresses
- Eyelid hygiene
- Antibiotics (topical and/or systemic)
- Topical anti-inflammatory agents (e.g., corticosteroids, cyclosporine)

These treatment options are often used in combination. Eyelid hygiene is especially useful for anterior blepharitis, while warm compresses are especially helpful for posterior blepharitis. The optimal treatment regimen often requires a trial and error approach. An initial step in treating patients with blepharitis is to recommend warm compresses and eyelid hygiene, which may be accomplished in several ways.

One regimen is to apply warm compresses to the eyelids for several minutes to soften adherent crustations and/or warm the meibomian secretions. Sustained warmth can be achieved by using hot tap water on a clean wash cloth or by heating a gel pack or bag of rice in the microwave. It is very important to instruct patients to avoid using compresses that are so hot that they burn the skin.

Eyelid hygiene can be accomplished by brief, gentle massage of the eyelids. Vertical eyelid massage can be used to express meibomian secretions. Rubbing the eyelid margins from side to side removes crusting from the eyelashes. Cleaning the eyelid can be safely accomplished by having the patient gently rub the base of the eyelashes using either diluted baby shampoo or commercially available eyelid cleaner on a pad, cotton ball, cotton swab, or clean finger tip. Cleaning the lid with any of the above devices and/or digital massage potentially can be dangerous if the patient lacks manual dexterity or the necessary skill or judgment to perform the task safely. The ophthalmologist should consider the patient’s ability to perform this treatment and tailor the therapeutic plan accordingly. A schedule of regularly performed eyelid hygiene, daily or several times weekly, often blunts the symptoms of chronic blepharitis.

Once or twice daily compresses and massage, at the time most convenient for the patient, is generally adequate. Frequent manipulation of the eyelid may lead to mechanically induced irritation. Some patients find it useful to repeat the warm compress and eyelid hygiene treatment more frequently during the day. Patients should be advised that warm compress and eyelid hygiene treatment, if effective, may be required long term, because the symptoms often recur if treatment is discontinued.

A topical antibiotic ointment such as bacitracin or erythromycin can be prescribed and applied on the eyelid margins one or more times daily or at bedtime for 1 or more weeks. In severe cases or for patients who do not tolerate ointments, metronidazole gel applied to the eyelid skin is an alternate treatment (off label). The frequency and duration of treatment should be guided by the severity of the blepharitis and response to treatment. The clinical efficacy of tobramycin/dexamethasone ophthalmic suspension and azithromycin in a sustained release system has been evaluated in uncontrolled (off-label), manufacturer-sponsored studies and appear to reduce some of the signs and symptoms of blepharitis.

For patients with MGD, whose chronic symptoms and signs are not adequately controlled with eyelid hygiene, an oral tetracycline can be prescribed. Doxycycline or minocycline 100 mg or tetracycline 1000 mg in divided doses can be given daily, to be tapered to doxycycline or minocycline 40 mg to 50 mg or tetracycline 250 mg to 500 mg daily after clinical improvement is noted (usually 2 to 6 weeks). Alternatively, oral erythromycin (250 mg to 500 mg daily) or azithromycin (250 mg to 500 mg, one to three times a week) can be used. Macrolide antibiotics (e.g., erythromycin, azithromycin) also have anti-inflammatory activity. Treatments can be intermittently discontinued and reinstated, based on the severity of the patient’s blepharitis and tolerance for the medication, and to allow recolonization of normal flora. The rationale for the use of tetracyclines is based in part on small clinical trials that report efficacy of the drugs in improving symptoms in patients with ocular rosacea and improving tear breakup time in patients with rosacea and MGD. The tetracyclines decrease lipase production in both S. epidermidis and S. aureus. Tetracycline and related drugs can cause photosensitization, gastrointestinal upset, vaginitis, and, rarely, azotemia. They have been implicated in cases of pseudotumor cerebri, and
mechanism of degradation may alter the effectiveness of certain medications (e.g., decrease the effectiveness of oral contraceptives and potentiate the effect of warfarin). A sustained-release 40-mg preparation of doxycycline can be used to reduce side effects. Tetracyclines are contraindicated in pregnancy, for nursing women, and for patients with a history of hypersensitivity to tetracyclines. Tetracyclines also should not be used in children under 10 years of age, since staining of teeth may occur; however, oral erythromycin may be substituted. Minocycline has been reported to stain skin, thyroid, nails, sclera, teeth, conjunctiva, tongue, and bone.

A brief course of topical corticosteroids may be helpful for eyelid or ocular surface inflammation such as severe conjunctival injection, marginal keratitis, or phlyctenules. Corticosteroid eye drops or ointments are typically applied several times daily to the eyelids or ocular surface. Once the inflammation is controlled, the corticosteroid can be tapered and discontinued and then used intermittently to maintain patient comfort. The minimal effective dose of corticosteroid should be utilized, and long-term corticosteroid therapy should be avoided if possible. Patients should be informed of the potential adverse effects of corticosteroid use, including the risk for developing increased intraocular pressure and cataract. These adverse effects may be minimized by using a site-specific corticosteroid such as loteprednol etabonate and corticosteroids with limited ocular penetration, such as fluorometholone. Guidelines for maintenance therapy should be discussed. Topical cyclosporine 0.05% may be helpful in some patients with posterior blepharitis. Diet modification has been a traditional (though not well documented) way of managing acne rosacea. The role of omega-3 dietary supplementation in the management of blepharitis was evaluated in a one-year study in which patients took two 1000 mg capsules of omega-3 fatty acid 3 times a day. Those receiving the supplement demonstrated an improvement in the tear film break-up time, Ocular Surface Disease Index and meibum score, suggesting a potential benefit for this treatment in some blepharitis patients. Because many blepharitis patients have evaporative and aqueous tear deficiency, artificial tears may improve symptoms when used as an adjunct to eyelid hygiene and medications. If used more than four times per day, nonpreserved tears should be used to avoid preservative toxicity. Topical cyclosporine and/or punctal plugs may also be helpful in managing coexisting dry eye syndrome.

Patients with atypical eyelid-margin inflammation or disease not responsive to medical therapy should be carefully re-evaluated. The presence of features such as nodular mass, ulceration, extensive scarring, lash loss, localized crusting and scaling of the dermis, or yellow conjunctival nodules surrounded by intense inflammation may suggest the presence of an eyelid tumor. Basal cell carcinoma and squamous cell carcinoma are the most frequently encountered malignant tumors involving the eyelids. Melanoma and sebaceous gland carcinoma are the next most frequently diagnosed malignant tumors of the eyelid. Sebaceous gland carcinoma may have a multicentric origin and may induce severe conjunctival inflammation due to pagetoid spread, and it may be difficult to diagnose. Sebaceous gland carcinoma should be considered in elderly patients with unresponsive unilateral blepharitis, conjunctivitis, or recurrent chalazia.

Some patients who did not improve with the above treatments for blepharitis and rosacea improved when therapy was directed to eradicate mites. Improvement in symptoms and signs were recently reported with weekly 50% tea-tree oil eyelid scrubs and daily tea-tree oil shampoo scrubs when used for a minimum of 6 weeks. In a single case report, prolonged treatment with metronidazole gel 2% with eyelid scrubs was used to treat chronic Demodex blepharitis. The 2% formulation of metronidazole gel is not commercially available in the United States. Oral ivermectin has also been reported to be of benefit in some cases of recalcitrant Demodex blepharitis.

**FOLLOW-UP**

Patients with mild blepharitis should be advised to return to their ophthalmologist if their condition worsens. Visit intervals for patients are dictated by the severity of symptoms and signs, the current therapy, and comorbid factors such as glaucoma in patients who have been treated with corticosteroids. The follow-up visit should consist of an interval history, measurement of visual acuity, external examination, and slit-lamp biomicroscopy. If corticosteroid therapy is prescribed, patients should be re-evaluated within a few weeks to determine the response to therapy, measure intraocular pressure, and assess treatment compliance.
The diagnosis and management of blepharitis requires broad medical skills and experience because of the potential association of systemic conditions, including cancer, with eyelid inflammation. At times, a multidisciplinary approach with a dermatologist, allergist, or oculoplastic specialist can be helpful. Patients with blepharitis who are evaluated by nonophthalmologist health care providers should be promptly referred to an ophthalmologist if any of the following occurs:\[A:III\]

- Visual loss
- Moderate or severe pain
- Severe or chronic redness
- Corneal involvement
- Recurrent episodes
- Lack of response to therapy

One of the most important aspects of caring for patients with blepharitis is educating them about the chronicity and recurrence of the disease process.\[A:III\] Patients should be informed that symptoms can frequently be improved but are rarely eliminated.\[A:III\]
APPENDIX 1. QUALITY OF OPHTHALMIC CARE CORE CRITERIA

Providing quality care is the physician's foremost ethical obligation, and is the basis of public trust in physicians.
AMA Board of Trustees, 1986

Quality ophthalmic care is provided in a manner and with the skill that is consistent with the best interests of the patient. The discussion that follows characterizes the core elements of such care.

The ophthalmologist is first and foremost a physician. As such, the ophthalmologist demonstrates compassion and concern for the individual, and utilizes the science and art of medicine to help alleviate patient fear and suffering. The ophthalmologist strives to develop and maintain clinical skills at the highest feasible level, consistent with the needs of patients, through training and continuing education. The ophthalmologist evaluates those skills and medical knowledge in relation to the needs of the patient and responds accordingly. The ophthalmologist also ensures that needy patients receive necessary care directly or through referral to appropriate persons and facilities that will provide such care, and he or she supports activities that promote health and prevent disease and disability.

The ophthalmologist recognizes that disease places patients in a disadvantaged, dependent state. The ophthalmologist respects the dignity and integrity of his or her patients, and does not exploit their vulnerability.

Quality ophthalmic care has the following optimal attributes, among others.

♦ The essence of quality care is a meaningful partnership relationship between patient and physician. The ophthalmologist strives to communicate effectively with his or her patients, listening carefully to their needs and concerns. In turn, the ophthalmologist educates his or her patients about the nature and prognosis of their condition and about proper and appropriate therapeutic modalities. This is to ensure their meaningful participation (appropriate to their unique physical, intellectual and emotional state) in decisions affecting their management and care, to improve their motivation and compliance with the agreed plan of treatment, and to help alleviate their fears and concerns.

♦ The ophthalmologist uses his or her best judgment in choosing and timing appropriate diagnostic and therapeutic modalities as well as the frequency of evaluation and follow-up, with due regard to the urgency and nature of the patient's condition and unique needs and desires.

♦ The ophthalmologist carries out only those procedures for which he or she is adequately trained, experienced and competent, or, when necessary, is assisted by someone who is, depending on the urgency of the problem and availability and accessibility of alternative providers.

♦ Patients are assured access to, and continuity of, needed and appropriate ophthalmic care, which can be described as follows.
  • The ophthalmologist treats patients with due regard to timeliness, appropriateness, and his or her own ability to provide such care.
  • The operating ophthalmologist makes adequate provision for appropriate pre- and postoperative patient care.
  • When the ophthalmologist is unavailable for his or her patient, he or she provides appropriate alternate ophthalmic care, with adequate mechanisms for informing patients of the existence of such care and procedures for obtaining it.
  • The ophthalmologist refers patients to other ophthalmologists and eye care providers based on the timeliness and appropriateness of such referral, the patient's needs, the competence and qualifications of the person to whom the referral is made, and access and availability.
  • The ophthalmologist seeks appropriate consultation with due regard to the nature of the ocular or other medical or surgical problem. Consultants are suggested for their skill, competence, and accessibility. They receive as complete and accurate an accounting of the problem as necessary to provide efficient and effective advice or intervention, and in turn respond in an adequate and timely manner.
  • The ophthalmologist maintains complete and accurate medical records.
• On appropriate request, the ophthalmologist provides a full and accurate rendering of the patient’s records in his or her possession.
• The ophthalmologist reviews the results of consultations and laboratory tests in a timely and effective manner and takes appropriate actions.
• The ophthalmologist and those who assist in providing care identify themselves and their profession.
• For patients whose conditions fail to respond to treatment and for whom further treatment is unavailable, the ophthalmologist provides proper professional support, counseling, rehabilitative and social services, and referral as appropriate and accessible.

◆ Prior to therapeutic or invasive diagnostic procedures, the ophthalmologist becomes appropriately conversant with the patient’s condition by collecting pertinent historical information and performing relevant preoperative examinations. Additionally, he or she enables the patient to reach a fully informed decision by providing an accurate and truthful explanation of the diagnosis; the nature, purpose, risks, benefits, and probability of success of the proposed treatment and of alternative treatment; and the risks and benefits of no treatment.

◆ The ophthalmologist adopts new technology (e.g., drugs, devices, surgical techniques) in judicious fashion, appropriate to the cost and potential benefit relative to existing alternatives and to its demonstrated safety and efficacy.

◆ The ophthalmologist enhances the quality of care he or she provides by periodically reviewing and assessing his or her personal performance in relation to established standards, and by revising or altering his or her practices and techniques appropriately.

◆ The ophthalmologist improves ophthalmic care by communicating to colleagues, through appropriate professional channels, knowledge gained through clinical research and practice. This includes alerting colleagues of instances of unusual or unexpected rates of complications and problems related to new drugs, devices or procedures.

◆ The ophthalmologist provides care in suitably staffed and equipped facilities adequate to deal with potential ocular and systemic complications requiring immediate attention.

◆ The ophthalmologist also provides ophthalmic care in a manner that is cost effective without unacceptably compromising accepted standards of quality.

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APPENDIX 2. SUMMARY OF MAJOR RECOMMENDATIONS FOR CARE

DIAGNOSIS

The initial evaluation of a patient with symptoms and signs suggestive of blepharitis should include the relevant aspects of the comprehensive medical eye evaluation.\textsuperscript{37,38}[A:III]

Patient History

Questions about the following elements of the patient history may elicit helpful information:

- Symptoms and signs:[A:III] e.g., redness, irritation, burning, tearing, itching, crusting of eyelashes, loss of eyelashes, eyelid sticking, contact lens intolerance, photophobia, increased frequency of blinking
- Time of day when symptoms are worse\textsuperscript{[A:III]}
- Duration of symptoms\textsuperscript{[A:III]}
- Unilateral or bilateral presentation\textsuperscript{[A:III]}
- Exacerbating conditions:[A:III] e.g., smoke, allergens, wind, contact lenses, low humidity, retinoids, diet and alcohol consumption, eye makeup
- Symptoms and signs related to systemic diseases:[A:III] e.g., rosacea, allergy
- Current and previous systemic and topical medications:[A:III] e.g., antihistamines or drugs with anticholinergic effects, or drugs used in the past that might have an effect on the ocular surface (e.g., isotretinoin)
- Recent exposure to an infected individual:[C:III] e.g., pediculosis palpebrarum (Pthirus pubis)

The ocular history may include details about previous intraocular and eyelid surgery, as well as local trauma, including mechanical, thermal, chemical, and radiation injury. A history of cosmetic blepharoplasty is important to obtain because it can make evaporative dry eye worse. A history of styes and/or chalazia is common.

The medical history may also include information about dermatological diseases such as rosacea, atopic disease, and herpes zoster ophthalmicus.

Examination

Examination of the eye and adnexa includes measurement of visual acuity,[A:III] an external examination,[A:III] slit-lamp biomicroscopy,[A:III] and measurement of intraocular pressure.[A:III] The external examination should be performed in a well-lighted room with particular attention to the following:

- Skin\textsuperscript{[A:III]}
- Eyelids\textsuperscript{[A:III]}

The slit-lamp biomicroscopy should include evaluation of the following:

- Tear film\textsuperscript{[A:III]}
- Anterior eyelid margin\textsuperscript{[A:III]}
- Eyelashes\textsuperscript{[A:III]}
- Posterior eyelid margin\textsuperscript{[A:III]}
- Tarsal conjunctiva (everting eyelids)\textsuperscript{[A:III]}
- Bulbar conjunctiva\textsuperscript{[A:III]}
- Cornea\textsuperscript{[A:III]}

Diagnostic Tests

A biopsy of the eyelid may be indicated to exclude the possibility of carcinoma in cases of marked asymmetry, resistance to therapy, or unifocal recurrent chalazia that do not respond well to therapy.\textsuperscript{42}[A:III] Before obtaining a biopsy for suspected sebaceous gland carcinoma, consultation with a pathologist is recommended\textsuperscript{[A:III]} to discuss the potential need for frozen sections and mapping of the conjunctiva to search for pagetoid spread.
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The frequency and duration of treatment should be guided by the severity of the blepharitis and response to treatment.

For patients with MGD, whose chronic symptoms and signs are not adequately controlled with eyelid hygiene, an oral tetracycline can be prescribed. Alternatively, oral erythromycin (250 mg to 500 mg daily) or azithromycin (250 mg to 500 mg, one to three times a week) can be used.

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Patients should be informed of the potential adverse effects of corticosteroid use, including the risk for developing increased intraocular pressure and cataract.

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PROVIDER

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- Recurrent episodes
- Lack of response to therapy

COUNSELING/REFERRAL

One of the most important aspects of caring for patients with blepharitis is educating them about the chronicity and recurrence of the disease process. Patients should be informed that symptoms can frequently be improved but are rarely eliminated.
RELATED ACADEMY MATERIALS

Basic and Clinical Science Course
External Disease and Cornea (Section 8, 2011-2012)

Patient Education Brochures
Blepharitis (Spanish – Blefaritis) (2011)
Eyelid Margin Disease Including Blepharitis (2011)

Preferred Practice Pattern
Comprehensive Adult Medical Eye Evaluation (2010)

To order any of these materials, please call the Academy’s Customer Service number, 866.561.8558 (U.S. only) or 415.561.8540 or visit www.aao.org/store.

REFERENCES


