

Clinical & Refractive Optometry is pleased to present this continuing education (CE) article by Dr. Ron Melton and Dr. Randall Thomas entitled **Oral Medications in Primary Eye Care**. In order to obtain 2-hours of COPE-approved CE credit, please refer to page 136 for complete instructions.

Oral Medications in Primary Eye Care

Ron Melton, OD; Randall Thomas, OD

INTRODUCTION

Our job as eye care physicians is to help patients in need. While we can usually treat patients' ocular conditions with topical medications, oral medications are required to optimally care for patients who have less common clinical conditions.

The classes of oral medications germane to eye care are: antibiotics, antivirals, analgesics, antiallergy agents, corticosteroids, and carbonic anhydrase inhibitors.

ANTIBIOTICS

Antibiotics are commonly used to treat patients who have internal hordeola, severe external infections, chlamydial conjunctivitis, preseptal cellulitis, or chronic meibomianitis.

Most cases of internal hordeola respond to aggressive application of warm compresses (10 minutes at a time, repeated at least q.i.d.). For patients with larger, more tender and painful hordeola (Fig. 1 A, B), heat therapy may need to be supplemented with oral antibiotics. For patients who are not allergic to penicillin or cephalosporin, we suggest cephalexin (Keflex) 500 mg b.i.d. When patients have an allergy to penicillin or a cephalosporin, we recommend an oral fluoroquinolone such as levofloxacin (Levaquin) at 500 mg once daily. A macrolide antibiotic like erythromycin 500 mg b.i.d. could also be used as an alternative to Keflex and Levaquin. Oral antibiotics are usually given for 7 days.

The same approach can be used with patients with severe bacterial infections or preseptal cellulitis. However, *Neisseria gonorrhoeae* infections causing a hyperactive conjunctivitis are best treated with intramuscular ceftriaxone sodium (Rocephin).

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Fig. 1A This 52-year-old presented with a 4-day history of a left upper lid external hordeolum with superior preseptal cellulitis with periorbital swelling. Keflex (cephalexin) 500 mg b.i.d. p.o. was prescribed for 1 week along with the frequent application of warm compresses.

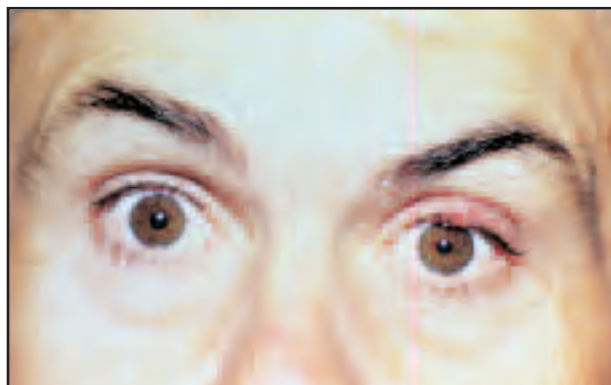


Fig. 1B After 4 days the left upper lid and surrounding tissues are responding beautifully to the systemic antibiotic therapy.

Adult inclusion conjunctivitis caused by *Chlamydia trachomatis* is treated with the macrolide antibiotic azithromycin (Zithromax), a single dose of 1000 mg. This unique conjunctivitis is often characterized by a unilateral, mildly to moderately infected eye, with giant follicles in the inferior forniceal conjunctiva. There is marked papillary hypertrophy of the superior palpebral conjunctiva which has failed to respond to topical antibiotics. Most of these patients are 15 to 35 years old, sexually active, and asymptomatic or mildly symptomatic.



Fig. 2A This 75-year-old man presented with a 5-day history of a severe right herpes zoster ophthalmicus.

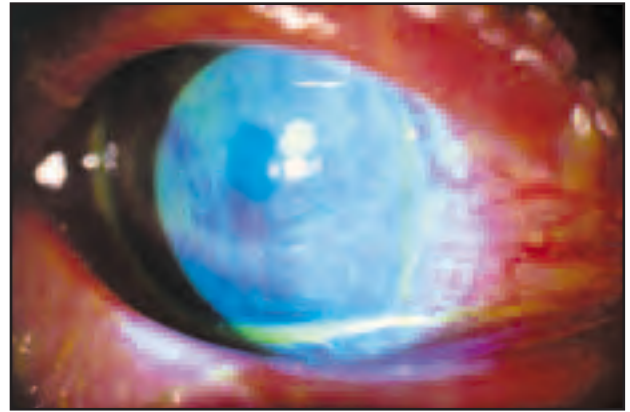


Fig. 2B At his initial visit, the patient shows moderate conjunctivitis with an epithelial irregularity that has a dendritic appearance mimicking herpes simplex virus.



Fig. 2C At a 10-day follow-up visit, the patient shows significant improvement, in response to systemic antiviral medication. He had been prescribed a 7-day course of Famvir 500 mg t.i.d. p.o. for 1 week, and polysporin ophthalmic ointment to apply to the right lids b.i.d. and to the right eye at bedtime. Because he still experienced a lot of discomfort, he was prescribed Lortab 5 one tablet every 6 hours p.o. as needed for pain for 1 week. The Lortab allowed him to better tolerate his condition.

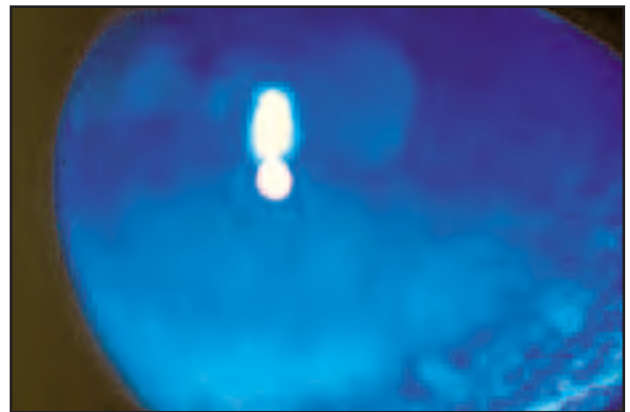


Fig. 2D At a 10-day follow-up visit the epithelial irregularity had returned to normal.

Posterior blepharitis (meibomianitis) is a common cause of tear-film dysfunction. For patients with “evaporative” dry-eye disease and chronic, inspissated (plugged) meibomian glands, oral doxycycline can be helpful. It is prescribed as 100 mg b.i.d. for two to four weeks, then 100 mg daily for approximately three to six months.

ANTIVIRALS

These drugs are very important for treating varicella zoster disease, and can be immensely helpful in cases of herpes simplex disease. There are three oral antivirals: acyclovir (Zovirax and generics), valacyclovir (Valtrex), and famciclovir (Famvir). These are all safer than aspirin,

and the most common side effect is occasional mild nausea. Since these drugs are activated only by virally infected cells, they have extremely low toxicity, which explains their enhanced safety profile. These medications are most effective when taken within 3 days of the onset of disease. However, a therapeutic course should be done even if care has been delayed by a week or so.

These antiviral drugs are effective for patients with ophthalmic herpes zoster virus infections (Fig. 2 A, B, C, D) and for those with herpes simplex keratitis. The standard doses for treating patients with herpes zoster ophthalmicus are the same doses used for treating patients with herpes zoster disease (shingles), the main disease for which they are prescribed. Herpes simplex is a less hardy virus, and is about twice as easy to kill as the zoster virus. There are, therefore, two dosing protocols for drugs to treat these two conditions. Acyclovir, because of its relatively short half-life, is prescribed five times a day, whereas the other



Fig. 3A This 13-year-old patient has a moderate allergic reaction to her left lids and periorbital region as a result of exposure to poison ivy.



Fig. 3B The patient shows a dramatic response to a short course of systemic prednisone.

two antivirals are used t.i.d. All are prescribed for 7 days. Dosing is summarized in Table I.

A word about herpes simplex keratitis. Topical trifluridine (Viroptic) remains the standard and accepted drug-of-choice for treating epithelial keratitis. However, if the patient is allergic to Viroptic, oral antivirals can be effectively used.

ANALGESICS

Corneal abrasion and recurrent epithelial erosions are by far the most common conditions that cause ocular surface pain. Most patients with ocular surface pain can be managed by using cycloplegia and applying pressure patches or soft contact lens (SCL) bandages. Patients with extensive surface damage and/or low pain tolerance thresholds, however, may require supplemental oral analgesics for a day or two until epithelial healing occurs. Analgesic agents that may be used in a primary eye care setting range from over-the-counter (OTC) products to Schedule II narcotics (Table II). Generally, we advise most of our patients to take what they usually take for headache or dental pain. When specifically asked, we usually recommend 400 mg of ibuprofen (Advil, Nuprin) q.i.d., taken with meals. On rare occasions, we prescribe Schedule III narcotics, such as hydrocodone (Lortab, Vicodin), or Schedule II narcotics, such as oxycodone (Tylox, Percocet). Most prescribed analgesics are given for three to four days, which is equivalent to approximately 12 tablets. With such short-term use, concerns regarding addictive potential are miniscule.

ANTIALLERGY MEDICATIONS

While it is true that most patients who visit eye care physicians with a chief complaint of “itchy eyes” have

pure allergic conjunctivitis, some patients have concurrent allergic sinusitis and/or rhinitis. For this subset of patients, oral antihistamines can be helpful.

Oral antihistamines, however, are more effective against sinusitis and/or rhinitis than against ocular symptoms. For this reason, there are times when treatment of ocular symptoms may require use of topical therapy along with oral antihistamines. Dry-eye disease often sets the stage for symptomatic itching and burning. Keep in mind that the drying effects of oral antihistamines can cause borderline dry-eye patients to become symptomatic, and can exacerbate symptomatic dry-eye disease.

We rarely prescribe antiallergy medications. However, occasionally, we see patients who require oral therapy, in addition to topical medications, to subdue the expression of their allergic disease. There are three drugs that we may consider using to treat such patients: ceterizine (Zyrtec) 5 mg or 10 mg q.d.; loratadine (Claritin) 10 mg q.d.; or fexofenadine (Allegra) 180 mg q.d. While Zyrtec is not officially categorized as a “non-sedating” antihistamine, it is certainly minimally sedating, and can be used in a similar manner as the other two drugs.

CORTICOSTEROIDS

While drugs in this class are notorious for their potential long-term side effects, safety concerns are minimal for short-term use. It is not uncommon for eye care practitioners to see patients who need oral steroids to regain tissue normality or gain control of ocular inflammation. Conditions for which corticosteroids may be considered include facial/periorbital poison oak/ivy exposure (Fig. 3 A, B), orbital pseudotumor, hyperacute allergic blepharodermatitis, contact blepharodermatitis (not responding to topical ophthalmic steroids), recalcitrant anterior uveitis, and recalcitrant episcleritis.

Table I Antiviral dosing regimens			
Antiviral agent	Medical condition		Dosing regimen
	Herpes Zoster	Herpes Simplex	
Acyclovir	800 mg	400 mg	5x a day
Valacyclovir	1000 mg	500 mg	t.i.d.
Famciclovir	500 mg	250 mg	t.i.d.

Table II Oral analgesics	
This list includes some of the more common oral medications that are used to manage pain that cannot be controlled by use of topical medications. Always consult the <i>Compendium of Pharmaceuticals or the Drug Facts and Comparisons</i> for detailed information on the particular drugs.	
Drug type	Dosage forms
Over-the-counter drugs	
Acetylsalicylic acid (ASA) - aspirin	325, 500 mg
Acetyl-para-aminophenol (APAP) - acetaminophen	325, 500 mg
Ibuprofen (Advil, Nuprin)	200 mg
Naproxen (Aleve)	220 mg
Prescription non-narcotic agents	
Ibuprofen (Motrin)	300, 400, 600, 800 mg
Indomethacin (Indocin)	25, 50 mg
Naproxen (Anaprox, Naprosyn)	250, 375, 500 mg
Tramadol HCl (Ultram)	50 mg
Prescription narcotic agents*	
Codeine (C-III)	
• Tylenol #3	(APAP 300 mg + codeine 30 mg)
Hydrocodone (C-III)	
• Lortab	(APAP 500 mg + hydrocodone 2.5, 5, 7.5 mg)
• Vicodin	(APAP 500 mg + hydrocodone 5 mg)
Oxycodone (C-II)	
• Percocet	(APAP 325 mg + oxycodone 5 mg)
• Percodan	(ASA 325 mg + oxycodone 4.5 mg)
• Tylox	(APAP 500 mg + oxycodone 5 mg)
*These drugs should be used with discretion because of their addictive potential.	

Proper prescribing of this class of drug generally requires asking two or three straightforward questions: “Do you have peptic ulcer disease?”; “Are you diabetic?”; and, for women, “Are you, or might you be, pregnant?”

Assuming the patient’s answers are negative, it is common to prescribe 40 to 60 mg of prednisone. Prednisone can be prescribed in prepackaged dose packs or generically in tablet form for use in moderate-to-severe allergic reactions to the eye or ocular adnexa. Corticosteroids are almost always dispensed as 10-mg tablets. A typical example for dosing is: 4 tablets p.o. x 2 days, then 2 tablets p.o. x 2 days, then 1 tablet p.o. x 2 days. When 60 mg or less is prescribed per day, the total dose can be taken at one time. When 80 mg a day or more is prescribed, divide the dosage to b.i.d. Consult with the patient’s primary care physician or obstetrician if one or more of the above three concerns is present.

There is a current trend in general medicine to use short-term, corticosteroid pulse therapy without tapering

the dose. For example, a patient exposed to a noxious substance may present with symptoms of right eyelid swelling shut, along with right-sided periorbital and facial swelling. After confirming the presence of allergic disease, a sound manner to address the acute swelling could be to prescribe a corticosteroid at 60 mg for one day (along with use of cold compresses), then 40 mg for one day, and then discontinue medication. As with all diseases, therapy must be individualized.

CARBONIC ANHYDRASE INHIBITORS

Carbonic anhydrase inhibitors are rarely used in chronic care, but can be tremendously helpful in managing acute intraocular pressure (IOP) spikes from all origins. These drugs are most commonly used to treat patients with acute angle-closure glaucoma.

Like many oral hypoglycemic (anti-diabetic) medications, carbonic anhydrase inhibitors are sulfonamide derivatives. Therefore, prior to prescribing these agents,

patients are always asked if they have a sulfa allergy. If the patient is not allergic to sulpha, prescribing two 250-mg tablets of acetazolamide (Diamox) is the primary therapeutic maneuver to reduce IOP in angle closure, or any other form of acute IOP increase. Diamox 250-mg tablets are important to have available for helping to break narrow-angle glaucoma attacks. Since Diamox 500 mg Sequels are “time release,” they are not optimally suited when rapid drug loading is desired. Only when a patient is allergic to sulfa would we employ an orally administered hyperosmotic agent, such as 50% glycerin (Osmoglyn), to treat angle closure. Over the last year oral glycerin has not been available, but hopefully it will return to the marketplace soon.

To treat chronic glaucoma, prescribing methazolamide (Neptazane) 25 mg b.i.d. could be considered if oral therapy were required to achieve target IOP. For chronic care, Neptazane has a relatively enhanced safety profile compared with other oral carbonic anhydrase inhibitors.

If state (or other) law prohibits the use of these oral agents, simply get written “standing orders” from the patient’s primary care physician, or consult an ophthalmologist for use of these agents to manage patients with acute angle-closure glaucoma. Every eye care physician in the world should have acetazolamide 250 mg tablets in

their office. We would not embark on an automobile trip without a spare tire, and in like manner, would not be in our practices without acetazolamide tablets.

CONCLUSION

As can readily be seen, there are many instances when patient care is enhanced through the use of oral medications. Topical medications are the mainstay for management of ocular disease, but oral medications are occasionally needed to meet our clinical challenges. It is obviously incumbent upon each of us to be as prepared as possible to meet the needs of our patients, and oral medications are another important weapon in our disease management arsenal. □

Disclaimer: Not every detail of every case is discussed, rather the key clinical findings are described. For example, if nothing is said about the corneal status, you should assume that the cornea is normal, etc. When vision is recorded, it should be assumed to be best corrected or pinholed. Regarding therapy, we show how we treated the particular case. Given that medicine is an art, as well as a science, therapy will — and often does — vary with each unique patient presentation depending on severity, known drug allergies, prior treatment, response to therapy, etc.



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QUESTIONNAIRE

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1. Which of the following statements about internal hordeola is **FALSE**?
 - Heat therapy may be used for larger, more tender and painful hordeola
 - Cephalexin (Keflex) 500 mg b.i.d. has been proven effective
 - The standard course of therapy is 10 days
 - Most cases respond to aggressive application of warm compresses
2. Which one of the following statements about dosing is **TRUE**?
 - In herpes zoster, the acyclovir dosing regimen is 800 mg 5x a day
 - In herpes simplex, the valacyclovir dosing regimen is 1000 mg t.i.d.
 - In herpes zoster, the valacyclovir dosing regimen is 800 mg t.i.d.
 - In herpes zoster, the famciclovir dosing regimen is 500 mg b.i.d.
3. Which of the following is **NOT** a commonly used oral analgesic for ocular pain management?
 - Percocet (APAP 325 mg + oxycodone 5 mg)
 - Empracet-60 b.i.d. (acetaminophen + codeine phosphate)
 - Tramadol HCl (Ultram) 50 mg
 - Ibuprofen (Advil, Nuprin) 200 mg
4. Adult inclusion conjunctivitis caused by *Chlamydia trachomatis* is treated by which of the following?
 - Azithromycin (Zithromax) single dose 1000 mg
 - Azithromycin (Zithromax) 500 mg b.i.d. x 1 week
 - Biaxin 500 mg b.i.d.
 - Intramuscular ceftriaxone sodium (Rocephin)

5. Which of the following statements regarding the case presented of herpes zoster ophthalmicus describes the patient's treatment regimen?
 - He underwent a 7-day course of Famvir 500 mg t.i.d. p.o. for 1 week
 - He was administered Lortab 5 one tablet every 6 hours p.o. for pain for 1 week
 - He was prescribed polysporin ophthalmic ointment for the right lids b.i.d. and to the right eye at bedtime
 - All of the above

6. Which of the following statements about antivirals is **TRUE**?
 - Acyclovir, valacyclovir and famciclovir have been shown to be safer than aspirin
 - Acyclovir, valacyclovir and famciclovir have extremely low toxicity
 - These agents are most effective when taken within 3 days of disease onset
 - All of the above

7. Which of the following statements about posterior blepharitis (meibomianitis) is **FALSE**?
 - It is a common cause of tear film dysfunction
 - In cases of "evaporative" dry-eye disease, oral doxycycline is recommended
 - The treatment regimen for oral doxycycline is 100 t.i.d. for 2-4 weeks, then 100 mg daily for approximately 3-6 months
 - In cases of chronic, inspissated (plugged) meibomian glands, oral doxycycline is recommended

8. Which one of the following statements about treatment of herpes simplex keratitis is **NOT** accurate?
 - Topical Viroptic is rarely used due to frequent allergic reaction
 - Acyclovir is prescribed five times a day due to its short half-life
 - Zovirax, valacyclovir and famciclovir may be used
 - The standard course of therapy for valacyclovir and famciclovir is 7 days

9. In which of the following cases is prednisone used only with caution, or not recommended?
 - Pregnancy
 - Peptic ulcer disease
 - Diabetes
 - All of the above

10. Which of the following statements is **FALSE**?
 - Oral analgesics are typically used for management of pain that cannot be controlled by topical medications
 - Even with short-term use of prescription analgesics, addictive potential is a concern
 - Most patients with ocular surface pain can be managed with cycloplegia and pressure patches or soft contact lens bandages
 - Recommended treatment is what patients normally take for headache or dental pain

11. Which of the following statements is **FALSE**?
 - An alternative to cephalexin (Keflex) in the event of allergy is levofloxacin (Levaquin)
 - Erythromycin can be used in the event of allergy to levofloxacin (Levaquin)
 - In the event of an allergy to cephalosporins, a patient is likely to have an allergy to fluoroquinolones
 - Levofloxacin (Levaquin) can be used in the event of allergy to penicillin

12. Which one of the following classes of oral medications is germane to eye care?
 - Corticosteroids
 - Carbonic anhydrase inhibitors
 - Antiallergy agents
 - All of the above

13. The common complaint of "itchy eyes" can be attributed to which of the following?
 - Sinusitis
 - Rhinitis
 - Pure allergic conjunctivitis
 - All of the above

14. Which of the following statements is **FALSE**?
- Oral antihistamines tend to have drying effects such as contributing to dry eye
 - Oral antihistamines are more effective against sinusitis and/or rhinitis than against ocular symptoms
 - Antiallergy medications are always recommended in the presence of ocular symptoms, as an adjunct to topical therapy
 - Dry-eye disease may cause symptomatic itching and burning
15. Identify the antiallergy medication that is **NOT** typically used by eye care physicians:
- Fexofenadine (Allegra) 180 mg q.d.
 - Loratidine (Claritin) 10 mg q.d.
 - Tecastemizole (Soltara) 30 mg q.d.
 - Citerizine (Zyrtec) 5 mg or 10 mg q.d.
16. Which one of the following statements is **TRUE**?
- Two 250-mg tablets of acetazolamide (Diamox) is primary therapy in reduction of IOP in angle closure
 - Diamox 500 mg Sequels are not a therapy of choice for rapid drug loading
 - Patients with an allergy to sulpha should not be prescribed acetazolamide (Diamox)
 - All of the above
17. Which of the following statements does **NOT** describe adult inclusion conjunctivitis caused by Chlamydia trachomatis?
- Bilateral, mildly to moderately infected eye
 - Giant follicles in the inferior forniceal conjunctiva
 - Marked papillary hypertrophy of the superior palpebral conjunctiva
 - Prevalence in the 15- to 35-year-old age group
18. Which of the following statements about corticosteroids is **FALSE**?
- A dosage of 80 mg per day exceeds the recommended daily dose
 - 40 mg to 60 mg per day of prednisone is a common dosing range
 - When 60 mg or less is prescribed per day, the total dose may be taken at one time
 - Corticosteroid pulse therapy can be used in cases of acute swelling
19. Which of the following is recommended treatment for severe bacterial infections?
- Cephalexin (Keflex)
 - Levofloxacin (Levaquin)
 - Erythromycin
 - All of the above
20. Identify the condition for which corticosteroids may be considered:
- Orbital pseudotumor
 - Blepharodermatitis
 - Fungal keratitis
 - Contact blepharodermatitis