

Cataract & Refractive Surgery TODAY

Pharmacoeconomics and Patient Compliance With Ophthalmic NSAIDs

Considerations between
branded and generic
formulations.

The Role of NSAIDs
in Cataract Surgery

By Kerry D. Solomon, MD

Weighing the Choice Between
Generic and Branded Drugs

By Richard G. Fiscella, PharmD, MPH

Economic, Formulation, and
Prescribing Considerations With NSAIDs

By Louis D. "Skip" Nichamin, MD

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TARGET AUDIENCE

This certified CME activity is designed for general ophthalmologists and anterior segment surgeons specializing in cornea, refractive, and cataract surgery.

STATEMENT OF NEED

This activity will provide education on the evidence for efficacy and bioavailability of generic ophthalmics, ophthalmic and systemic effects of medications, cost and economic issues, comfort and safety of available therapies, and patient adherence. Due to the current and projected increases in cataract surgical services in an aging population,¹ it is critical that clinicians recognize key considerations involving generic and brand-name anti-inflammatory medications, including efficacy and bioavailability, as well as treatment regimens that minimize the side effects of perioperative pharmaceutical use.² Busy cataract surgeons need to be aware of emerging information and patient management strategies in order to optimize treatment planning, cost considerations, and patient compliance.

It is important that specialists recognize that there is limited direct evidence that compares the efficacy and bioavailability of generic anti-inflammatory ophthalmic medications with brand-name agents. Provided that generics are formulated with the same active product, their safety and efficacy are assumed based on the safety and efficacy profile of the branded products. In a roundtable discussion,³ Richard G. Fiscella, PharmD, MPH, said, "We cannot know, for instance, if the same concentration of drug A and drug B penetrates the anterior chamber, reaches the target site, etc. There have been instances when generic products were not equivalent to their brand-name counterpart and have been taken off the market. This occurred with a generic topical ophthalmic formulation of Voltaren (diclofenac; Novartis Pharmaceuticals Corporation, East Hanover NJ) that caused corneal melts and perforations.⁴ Inequivalence was also reported with a brand-name versus generic prednisolone acetate product."^{5,6}

Generic formulations are not required to have the same excipient ingredients as brand formulations and may differ in ingredients besides the active molecule, including buffers, PH adjusters, preservatives, and vehicle, experts have noted.⁷ Therefore, efficacy with new formulations of anti-inflammatory pharmaceuticals must be carefully monitored, and until the full range of the effects of generic medications is known, tolerability and patient compliance should be carefully examined on a case-by-case basis.

Patients undergoing cataract surgery are prescribed both anti-infective and anti-inflammatory pharmaceuticals, which often places both an economic and medication compliance burden on patients. Surgeons need to assess each case for factors that may influence pharmaceutical effectiveness and patient compliance, as well as educate their patients on the importance of therapeutic compliance to prevent surgical complications. Much data have been published in the peer-reviewed literature regarding early detection and treatment of perioperative inflammation and the impact on patient visual outcomes.^{8,9} There is a need among eye care professionals, however, for a comprehensive, coherent review of specific, practical, clinical considerations related to issues such as the differences between generic and brand name medications, side effects of therapy, and strategies to reduce therapeutic adverse effects. The negative effects of preservatives in ocular therapeutics must also be considered.^{10,11}

Surgeons should remain vigilant to observe patients for possible reactions to differences in formulations of generic and brand-name anti-inflammatory pharmaceuticals. Managed care plans' medication cost tiers can impact which formulation a patient will be administered, so the burden of monitoring which brand-name or generic formulation a patient receives often falls to the prescribing surgeon.

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LEARNING OBJECTIVES

Upon completion of this activity, the participant should be able to:

- Understand why cataract surgeons write prescriptions for topical ophthalmic NSAIDs
- Evaluate the question of whether to prescribe brand-name or generic NSAID formulations
- Recognize the importance of patients' adherence to prescribed topical ophthalmic NSAIDs
- Implement strategies for educating patients about the importance of adhering to the prescribed therapy and work with patients to develop strategies for overcoming their barriers to adherence

METHOD OF INSTRUCTION

Participants should read the continuing medical education (CME) activity in its entirety. After reviewing the material, please complete the self-assessment test, which consists of a series of multiple-choice questions. To answer these questions online and receive real-time results, please visit <http://www.dulaneyfoundation.org> and click "Online Courses."

Upon completing the activity and achieving a passing score of over 70% on the self-assessment test, you may print out a CME credit letter awarding 1 *AMA PRA Category 1 Credit*.™ The estimated time to complete this activity is 1 hour.

ACCREDITATION AND DESIGNATION

This activity has been planned and implemented in accordance with the Essential Areas and policies of the Accreditation Council for Continuing Medical Education (ACCME) through the joint sponsorship of the Dulaney Foundation and *Cataract & Refractive Surgery Today*. The Dulaney Foundation is accredited by the ACCME to provide continuing education for physicians. The Dulaney Foundation designates this educational activity for a maximum of 1 *AMA PRA Category 1 Credit*.™ Physicians should claim credit only commensurate with the extent of their participation in the activity.

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FACULTY CREDENTIALS

Louis D. "Skip" Nichamin, MD, is Medical Director of Laurel Eye Clinic in Brookville, Pennsylvania. Dr. Nichamin may be reached at (814) 849-8344; nichamin@laureleye.com.

Richard G. Fiscella, PharmD, MPH, is a clinical professor, Department of Pharmacy Practice, University of Illinois at Chicago. Dr. Fiscella may be reached at (312) 413- 3687; fisc@uic.edu.

Kerry D. Solomon, MD, is Director, Carolina Eyecare Research Institute, Mt. Pleasant, South Carolina, and an adjunct clinical professor of ophthalmology at the Medical University of South Carolina in Charleston. Dr. Solomon may be reached at (843) 881-3937; kerry.solomon@carolinaeyecare.com.

FACULTY/STAFF DISCLOSURE DECLARATIONS

Dr. Nichamin is a consultant to Allergan, Inc., 3D Vision Systems LLC, Bausch + Lomb, Glaukos Corporation, Power Vision Inc., WaveTec Vision, LensAR, Inc., iScience Interventional, Inc., and RevitalVision, LLC. He holds stock in 3D Vision Systems LLC, RevitalVision, LLC, Harvest Precision Components, Inc., Power Vision Inc., and LensAR, Inc.

Dr. Fiscella has received grants/research support from Allergan, Inc., and Pfizer Inc., and he is a consultant for and is on the speakers' bureau of Allergan, Inc.

Dr. Solomon is a consultant to Alcon Laboratories, Inc., Allergan, Inc., Abbott Medical Optics Inc., Bausch & Lomb, Inspire Pharmaceuticals, Inc., QLT Inc., Sirion Therapeutics, WaveTec Vision, Aquesys, Inc., Glaukos Corporation, and Advanced Vision Research, Inc., and he holds stock in QLT Inc.

David W. Friess, OD, being involved in the planning, editing or peer review of this educational activity, has disclosed he is a consultant for TrueVision Systems, Inc., Alcon, Inc., and DurrieVision P.A.

All others involved in the planning, editing, and peer review of this educational activity have indicated they have no financial relationships to disclose.

The Role of NSAIDs in Cataract Surgery

The on- and off-label use of NSAID drops to prevent postoperative complications.

BY KERRY D. SOLOMON, MD

This article discusses the off-label use of topical ophthalmic NSAIDs.



Ophthalmologists initially used topical ophthalmic NSAIDs in cataract surgery for these drugs' ability to prevent pupillary miosis and control postoperative pain, and their FDA labeling remains as such.^{1,2} These days, however, ophthalmic surgeons employ NSAIDs such as nepafenac 0.1% (Alcon Laboratories, Inc., Fort Worth, TX), diclofenac 0.1% (Novartis Pharmaceuticals Corporation, East Hanover, NJ), bromfenac 0.09% (Ista Pharmaceuticals, Inc., Irvine, CA), and ketorolac 0.5% (Allergan, Inc., Irvine, CA) so routinely for the prophylaxis of cystoid macular edema (CME) that this off-label use has become the new standard of care in cataract surgery.

THE NECESSITY OF NSAIDS

Our understanding of CME has evolved significantly with the advent of more objective means of measuring visual acuity and retinal thickness.^{3,4} A growing body of literature corroborates what many practitioners had been saying for years: that although topical steroids are beneficial, the combination of a steroid and an NSAID is significantly more effective at combating inflammation, miosis, and CME after cataract surgery. In 2007, Henderson et al published the results of an analysis of 1,659 cataract surgeries performed at the Massachusetts Eye and Ear Infirmary in Boston between 2001 and 2006 that indicated that those treated with a steroid/NSAID combination recovered from CME significantly faster than those who received no treatment.⁵ An article published by Wittpenn et al in 2008 in the *American Journal of Ophthalmology* showed definitively that using an NSAID in conjunction with a topical steroid improved patients' contrast sensitivity, reduced retinal thickening, and prohibited the development of CME.⁶ Miyake et al conducted a prospective, double-masked study of 50 patients randomized to receive

"It is important for all cataract surgeons to treat their patients with topical NSAIDs prior to surgery to preempt the inflammatory cascade that leads to postoperative inflammation, irritation, and CME."

either diclofenac or the corticosteroid fluorometholone for 5 weeks after cataract surgery. The subjects who used the NSAID showed less aqueous flare than those who used the steroid.⁷ Stemming from these and other data, the prophylactic use of NSAIDs is based on the rationale that these drugs inhibit the production of cyclo-oxygenase and thereby protect ocular blood vessels that are susceptible to inflammation.⁸

Still, despite this evidence and the growing adoption of prophylaxis with NSAIDs, some physicians wonder if the practice is necessary in routine, low-risk cataract patients. They argue that CME does not occur often enough to warrant the routine use of these therapeutic agents, and that when subclinical CME does present, it tends to resolve without intervention within 6 weeks.⁹ However, recent evidence suggests that CME is associated with a slight decrease in permanent quality of vision and contrast sensitivity. Furthermore, many of these patients often suffer a permanent alteration their retinal architecture.^{10,11} Thus, I strongly believe that it behooves us to avoid the complication of CME from occurring, rather than treating the sequelae it causes.

PERSONAL REGIMEN

I think it is important for all cataract surgeons to treat their patients with topical NSAIDs prior to surgery to preempt the inflammatory cascade that leads to postoperative inflammation, irritation, and CME. I have my routine,

PRESERVED VERSUS UNPRESERVED DROPS

In a multicenter study conducted between 1997 and 2003,¹ ocular signs and symptoms were compared in more than 9,600 patients using preserved or preservative-free eye drops. The patients using the preservative-free eye drops were significantly less likely to present with ocular symptoms than those who were using the preserved eye drops.

1. Ammar D, Kahook MY. Effects of varying concentrations of benzalkonium chloride (BAK) alone and in marketed topical ophthalmic formulations on cultured human conjunctival epithelial cells. Presented at the World Glaucoma Congress; July 8, 2009; Boston.

low-risk patients begin an NSAID/steroid regimen 3 days before their surgery, and I ask them to continue using both drugs for 6 weeks after the surgery. The Wittpenn trial supports this duration of postoperative therapy. Patients who are at high risk for inflammation and CME, such as those with epiretinal membranes, a history of uveitis or iritis, or diabetes, I pretreat 1 week before surgery with the NSAID and steroid, and postoperatively, I have them continue the NSAID for at least 6 weeks and often longer based on their clinical examination.

PATIENT EDUCATION

I emphatically stress to my patients the importance of their purchasing and using both an NSAID and a topical steroid after their surgery, and I also counsel them to request the brands that I prescribe, rather than accept a generic version at the pharmacy. I have preferred the ketorolac products for the past 14 years because of their efficacy and safety.¹²⁻²⁰ I am wary of generic NSAIDs and steroids because of past complications documented with these formulations.^{21,22} Of course, some generic NSAIDs are safe, but the brand-name drugs have abundant research behind them and successful track records. I have recently adopted a b.i.d. NSAID formulation that is easy for my patients to comply with. These preservative-free drops have been very well tolerated, with no burning or stinging (see Preserved Versus Unpreserved Drops). The b.i.d. formulation acts like a sustained-release drop, allowing the carboxymethylcellulose to stay on the surface of the eye longer. Recent studies by Bucci have shown logarithmic increases in intraocular levels of ketorolac tromethamine compared with any other NSAID on the market, including traditional ketorolac.^{23,24} Furthermore, ketorolac tromethamine alters the eye's pH to increase its penetration and reduce the burning and stinging sometimes associated with ophthalmic NSAIDs. I tell my patients to use the drops until the vial runs out, and they have responded well to this formulation so far.

CONCLUSIONS

Modern cataract patients have much higher expectations than those of 5 or 10 years ago. They expect the surgery to improve the quality of their vision and the quality of their life. This expectation is even greater with premium refractive lens patients, who bear some of the cost of these technologies.²⁵ Premium IOL patients are highly motivated to do all they can to optimize their outcomes and are the most adherent patients when we tell them that it is important to use their postoperative medications to prevent infection, reduce inflammation, and eliminate long-term sequelae such as retinal thickening. Compliance with these instructions is made easier by therapeutic drops that can be dosed b.i.d. Finally, it is important for physicians to prescribe pharmaceuticals that have proven safety and efficacy data behind them, and they must counsel their patients to ask for the prescribed drug at the pharmacy. ■

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Weighing the Choice Between Generic and Branded Drugs

The uncertainty of the safety and efficacy of generic ophthalmic drugs.

BY RICHARD G. FISCELLA, PHARM.D, MPH



When discussing the differences between branded and generic drugs, it is important to differentiate between systemic and ophthalmic products. Systemic drugs are more easily replicated in generic form, because manufacturers can perform bioavailability studies to compare their absorption, efficacy, and elimination against those of the branded versions. Ophthalmic drugs, however, cannot be tested in this way, and thus there is little reassurance for physicians of these products' safety and efficacy until clinical experience has been established. The only federal regulation that exists for generic ophthalmic drugs is that they must contain the same concentration of active drug that is present in the branded solution. Without a way to measure how much drug enters the eye, however, practitioners must assume that the generic formulation will work the same as the branded version. As many ophthalmologists are aware, there have been a few instances in the past where generic ophthalmic products were not as safe or efficacious as their brand-name counterparts.

LACK OF DATA

Generally, it is difficult to demonstrate the efficacy of generic ophthalmic products. Although manufacturers are required by the FDA to make the generic version of a product in the same concentration, there may be an acceptable +/- range of the labeled concentration. With systemic medications, the traditional bioequivalence limit of 80% to 125% for non-narrow therapeutic range drugs for the bioavailability measures (AUC and C_{max}) is common. Again, bioavailability data are seldom available to indicate if a generic ophthalmic product may be harmful in patients until a complication is experienced. A classic example of this conundrum occurred with drops of the ophthalmic steroid prednisolone acetate 1%. In 1998, reports emerged that the generic product was inferior to the branded one.^{1,2} This ophthalmic steroid is a suspension, the brand-name form of which is milled into

“Without a way to measure how much drug enters the eye, practitioners must assume that the generic formulation will work the same as the branded version.”

a minute particle that suspends very well in the carrier agent and remains in suspension for some time. There is no government oversight for how suspensions are manufactured, and there were reports that some generic versions of this eye drop did not suspend properly. These formulations caked and plugged up the tip of eye drop bottles, and they generally required more shaking in the bottle to suspend the ingredients. We can imagine, therefore, that patients using the generic prednisolone acetate drops often did not shake the bottles enough to mix the suspension properly, and they probably did not receive much of the active drug, but only the vehicle. Thus, the quality of generic products is not always guaranteed.

Ophthalmologists may be more familiar with a serious problem that occurred with the generic topical NSAID diclofenac in 1999. The brand-name product had received rare case reports of complications. Within 13 months of the generic product's release, however, there were case reports of corneal melting and other similar complications in normal, healthy eyes after cataract surgery.³⁻⁵ Some of these eyes were so severely damaged that they required corneal transplants. There was no way for physicians to know there was a problem with the generic product. It was a solution, not a suspension, and the solubilizing agent (something not highly regulated by the FDA) was different from that in the brand-name formula and may have contributed to the generic drug's significant ocular morbidity in patients.⁶

Another example of problems with a generic ophthalmic formulation was reported in India in with latanoprost ophthalmic solution, a glaucoma drug.

DRUG PRICES IN THE US REFLECT MARKET FORCES

A study published in 2003 by professors at Wharton analyzed the cost of branded and generic drugs in the United States and eight other countries.¹ Danzon and Furukawa examined 1999 prices for 249 compounds (molecules), including all patented and generic products with these active ingredients.

The authors found that Americans have one of the highest uses of generic drugs as a percentage of total prescription volume, but that the prices of those drugs are lower compared with all the other countries studied except Canada. Prices for branded drugs are higher in the US than in most of the other countries, however. The authors cited the nature of American economics as the reason behind such differences in pricing. The US has lower-priced generic drugs because the country does not regulate the market, and thus the market is more competitive.

“In the U.S., where the generic sector is dominated by unbranded products, total generic share is 58% of units but only 18% of sales, reflecting relatively low generic prices. By contrast, in Germany, where most generics are branded, generic share is 61% of units but 34% of sales, reflecting relatively higher generic prices.”

The authors suggested that the high markup of brand-name drugs compared with their marginal costs reflected the cost of research to develop new drugs. “Research-based pharmaceuticals entail sizable fixed costs of R&D, which must be recouped if R&D is to continue.”

The authors contend that the issue of drug affordability in the US, especially for underinsured seniors, is one of insurance, not of price regulation.

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Narayanaswamy et al demonstrated better lowering of IOP with the brand-name version of the drug (Xalatan; Pfizer Inc., New York, NY) than with the generic version (Latanoprost; multiple manufacturers) in patients with primary open-angle glaucoma.⁷ Currently, only the brand-name version is available in the United States, although a generic version of latanoprost may become available here by 2011.

MANY REPORTS ANECDOTAL

One difficulty in determining the safety of a generic ophthalmic formulation is that many negative reports are anecdotal. Practitioners may claim at the podium or to each other that the generic version does not seem to give their patients an anti-inflammatory or an IOP-lowering effect equal to that of the brand-name drug, but it is difficult to determine scientifically whether generic agents are less efficacious than their branded counterparts. Consider cataract surgery as an example: even if it seems to a surgeon that his patients complain more about some ocular side effect (eg, stinging) with a generic versus a brand-name drug, he or she is not grading the amount of pain or inflammation suppression between the branded and generic drugs. Only head-to-

head studies of branded versus generic formulations (preferably conducted in contralateral eyes) provide concrete efficacy data, and such studies are not performed often. A drug’s safety is somewhat more easily ascertained, obviously, through observations of irritation like stinging and inflammation.

THE ECONOMICS OF GENERIC OPHTHALMIC DRUGS

Cost is obviously one of the main issues when physicians and patients are choosing between a generic and brand-name drug, especially in lean economic times. Generic formulations are not always much cheaper than the branded ones, however. When manufacturers have 6-month exclusivity on a generic product (called *sole-source generic drugs*), the drug may cost only 15% to 20% less than the branded version. Prices on generic drugs may not start to fall until multiple formulations come to market. When this happens, states set a maximum allowable cost for the generic formulations, and the manufacturers compete on price (*see Drug Prices in the US Reflect Market Forces*). In managed care, sole-source generics are often offered as second-tier options in the formulary, because they are too expensive to be first-tier options.

Physicians should be wary about prescribing or allowing the pharmacist to fill a prescription with a low-cost generic substitute, however. Walgreens and Walmart may offer generic ophthalmic medications at \$4 for a 30-day supply, but these drugs may not represent the community standard of ophthalmic care. Consider the difference between using a generic gentamicin antibiotic as opposed to a broader-spectrum, branded fluoroquinolone. A physician may feel comfortable prescribing the generic gentamicin in cases of conjunctivitis, but it would be less appropriate for postoperative prophylaxis. For example, the fourth-generation fluoroquinolone gatifloxacin with benzalkonium chloride (BAK), besides providing broad-spectrum coverage, rapid kill rates, and significant lowering of minimum inhibitory concentrations in otherwise resistant pathogens, was found to have a statistically significant lower rate of endophthalmitis than earlier-generation fluoroquinolones (ofloxacin and ciprofloxacin) and moxifloxacin.^{8,9} This is not to say that a generic antibiotic or NSAID would not treat a patient effectively, but we cannot be as certain of generics' efficacy as we can be with brand-name drugs that have undergone extensive testing.^{1,5}

Generally, I believe a pharmacist should dispense a generic drug if it is the only option available through the

patient's healthcare plan, and he or she should always discuss the option with the patient. Some people simply cannot afford a \$35 copay for a branded product. I would caution practitioners to only prescribe generic drugs that have an established track record. For now, most available ophthalmic antibiotic and NSAID agents are branded products. Because formulation problems with generic topical ophthalmic steroid suspensions have been reported, I would be cautious recommending these agents in eyes that have significant inflammation.^{1,2} ■

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Economic, Formulation, and Prescribing Considerations With NSAIDs

Are generic NSAIDs an acceptable substitute for brand-name topical ophthalmic agents?

BY LOUIS D. "SKIP" NICHAMIN, MD



Cataract surgeons have come to appreciate the indispensable role NSAIDs play in blocking one of the two arms of the inflammatory cascade during the perioperative period.

These drugs serve to reduce the incidence of cystoid macular edema (CME), quicken patients' rehabilitation from ocular surgery, and increase their comfort in the early postoperative period.^{1,2} NSAIDs help cataract surgeons to achieve the ever-increasing expectations of our patients to such an extent that their use is no longer strongly debated.¹ However, the use of generic topical ophthalmic NSAIDs is increasing due to multiple factors, not the least of which are economic influences. Thus, the question remains whether generic NSAIDs are an acceptable substitute for brand-name topical ophthalmic agents.

RISKS WITH GENERIC FORMULATIONS

My personal experience with generic ophthalmic drugs has been mixed. In 1999, while I was serving as Chairman of the Cataract Clinical Committee of the ASCRS, ophthalmic surgeons experienced an outbreak of serious complications from a generic diclofenac ophthalmic solution.^{3,4} This formulation was linked to cases of perilimbal thinning and corneal melts in certain at-risk patients. Pinpointing the cause of these problems was a difficult process, but investigators eventually determined that the complications were related to a metalloproteinase-dependent process that occurred in certain predisposed individuals—for example, those with rheumatoid arthritis and severe dry eye who were prescribed NSAIDs for a longer-than-usual duration.⁵ It is important to note that such problems could have occurred with any of the NSAID formulations available at the time, but it was significantly more common with the generic

"In general, practitioners prescribe brand-name pharmaceuticals because they believe in the efficacy of these agents, and they entrust that these formulations will be dispensed."

diclofenac agent. Furthermore, these complications often proved to be difficult to manage, and many affected patients required penetrating keratoplasties and other significant secondary operations. Thus, many ophthalmologists were sensitized to this potential complication with NSAIDs.

DISPENSING PRACTICES COMPLICATED THE OUTBREAK

Part of what complicated the effort to identify the cause of these corneal problems with generic diclofenac was that many surgeons of affected patients were unaware that their patients were using the generic formulation. In many instances, the patients' pharmacists had substituted the generic formulation against their surgeons' recommendations. Despite the well-documented consequences of this outbreak, pharmacists still continue to substitute generic versions of brand-name drugs (for many medical conditions) to a surprising extent. In general, practitioners prescribe brand-name pharmaceuticals because they believe in the efficacy of these agents, and they entrust that these formulations will be dispensed. Pharmacists, however, will often dispense a generic version at their discretion, and in many cases, patients are not aware that a substitution was made. Unless patients

“It is important that patients be made aware that pharmacists frequently substitute generic versions of prescribed medications at their discretion.”

bring their drops with them to their office visits for confirmation, neither the physician nor the patient may know that they had been dispensed the generic drug.

THE IMPORTANCE OF EDUCATING PATIENTS

I think that ophthalmologists, in general, need to better educate their patients about the importance of asking for brand-name medications when specifically prescribed. Patients need to understand that there may be differences between brand-name and generic formulations. For example, it is my current preference to use the most advanced formulation of ketorolac tromethamine ophthalmic solution 0.45%, based upon its improved efficacy and better tolerance as demonstrated in FDA trials.⁶ If patients were to understand and appreciate our reasons for prescribing these specific pharmaceuticals, they would probably be more apt to request them at the pharmacy, even if they are more expensive than their generic counterparts. Again, it would be helpful for patients to bring their dispensed drops into the office so that the technician or surgeon can verify the actual drug that is being used and document it on the patient's chart. This information would be particularly useful if the patient experienced an atypical response to or complication from the medication.

Furthermore, in this age of vastly improved patient education and consent processes, it is important that patients be made aware that pharmacists frequently substitute generic versions of prescribed medications at their discretion (this practice is legal in all states). An article in the *Wall Street Journal* in 2008 detailed how pharmacists are motivated to dispense generic medications over brand-name drugs because the profit margins for the former are generally greater.⁷ Although pharmacists claim that they make these substitutions to save patients money, and this well may be part of the reason, pharmacists also garner greater profit on the generics than they do on the branded drugs. Physicians can do their part to prevent this practice by writing “brand only” on the prescription. It may also be worthwhile for physicians to speak directly with their local pharmacists to explain the

importance of their dispensing the requested medication. This effort may help correct the misconception on the part of many pharmacists that physicians prescribe more expensive brand-name drugs because of their relationships with the manufacturers.

NSAID REGIMEN

I typically begin my cataract patients on an NSAID agent and a topical antibiotic several days prior to surgery. Because CME often presents at around 3 to 5 weeks postoperatively,⁸ the recommended dosing regimen has lengthened to 4 to 6 weeks after surgery. A lengthier steroid regimen is also important for patients who are predisposed to CME, such as diabetics with pre-existing macular edema and those with a history of iritis. If I prescribe a b.i.d. NSAID such as ketorolac tromethamine ophthalmic solution 0.45%, I start patients on it 2 or 3 days preoperatively and have them continue the drops for at least 4 weeks after surgery.

CONCLUSIONS

After shunning NSAIDs for some time after the unfortunate corneal melt outbreak, most ophthalmic surgeons are once again using these therapeutic agents routinely in cataract surgery. In doing so, we must ensure that our patients are receiving the specific medications that we feel are most suitable for the given clinical setting—those agents whose clinical data support their safety and efficacy. Patient education regarding the differences between brand-name and generic medications needs to be reinforced, and we must keep in mind that the particular formulation that we request may not always be selected by the dispensing pharmacy. ■

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1. True or false: the FDA approval labeling for topical ophthalmic NSAIDs includes an indication for treating cystoid macular edema.

- a. true
- b. false

2. Which of the following are key factors involved in patient compliance with generic and brand-name ophthalmic pharmaceuticals?

- a. medication side effects
- b. dosing regimens
- c. insurance plan coverage
- d. cost of medication
- e. all of the above

3. Which is not a data-supported benefit of combining a topical steroid and an NSAID in the therapeutic treatment of cataract patients?

- a. improved dry eye
- b. reduced retinal thickening
- c. improved contrast sensitivity
- d. reduced aqueous flare

4. What is the extent of federal regulation of generic ophthalmic drugs?

- a. they must contain the same concentration of all compounds present in the branded solution
- b. they must contain the same concentration of active drug that is present in the branded solution
- c. they must contain a percentage of the active drug that is present in the branded solution
- d. there is no federal regulation of generic ophthalmic drugs

5. The term *sole-source* generic drugs refers to

- a. branded generic drugs
- b. generic drugs that come from the same manufacturer as the branded version
- c. generic drugs for which the manufacturer has secured 6-month exclusivity
- d. none of the above

6. The main concern about generic topical ophthalmic drugs (especially antibiotics and anti-inflammatories) is what?

- a. insufficient concentrations
- b. inferior inactive ingredients
- c. lack of manufacturing oversight
- d. lack of efficacy data due the difficult nature of comparative bioavailability studies

7. How can physicians encourage patients to request and use postoperative medications as prescribed?

- a. educate them about the efficacy data supporting prescribed pharmaceuticals
- b. alert patients to confirm that the prescribed medication is received from the pharmacy
- c. ask them to bring the dispensed medication into the office for verification
- d. all of the above

8. What types of patients are predisposed to developing cystoid macular edema after cataract surgery?

- a. patients with diabetes
- b. those with a history of iritis
- c. those with pre-existing macular edema
- d. all of the above

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