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# MEDICATIONS 2011



## Highlights from Pacific Vision Institute Grand Rounds

Over 70 doctors from the entire Bay Area attended PVI Grand Rounds this month. 3 hours of CE credit were provided. The topic was Update on Medications.



**Dr. Terri Pickering, Glaucoma Specialist at the Glaucoma Center of San Francisco** presented an overview of medications for the treatment of glaucoma. She began with a review of all the available eye drops specifically comparing the brand name with the generic medications, the amount

of BAK in each, and their degree of 24-hour IOP control. BAK is associated with corneal epithelial toxicity, which is of increasing importance in these elderly patients who tend to have a greater incidence of dry eye disease and are on chronic therapy for glaucoma. Of note, Xalatan has the most BAK at 0.02%. There is a trend toward preservative free formulations and the use of alternative preservatives such as Purite and Sofzia.

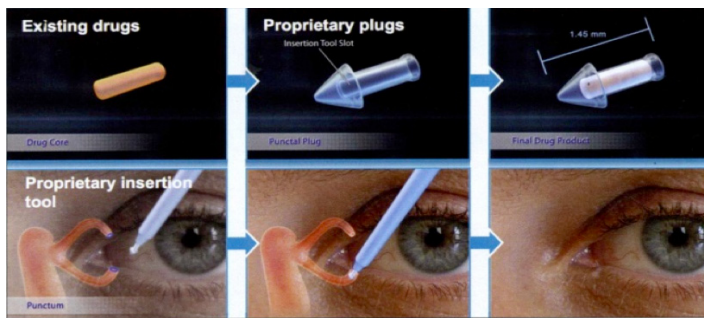
Although generic drugs have been used for years in glaucoma, the most recent generic, latanoprost, is produced by numerous manufacturers outside the United States so there is concern about efficacy and quality control.

Regarding 24-hour IOP control, Dr. Pickering reminded us that timolol does not work at night, while brimonidine does have a weak effect during sleeping hours. Genetics also plays an important role in determining which medications are effective for a patient, and therefore, in the future we may rely on simple genetic tests to detect single nucleotide polymorphisms (SNPs) in order to guide therapy choices. Other future directions include the use of prostones, nitric oxide-



### • Test Your Knowledge •

turn to the last page and take a quiz to test your knowledge of managing patients with refractive surgery, cornea, cataract, and lens procedures. The answers are provided at the end of the quiz.



**Figure 1.** Medications can be delivered via punctal plugs to provide continuous release of the drug and reducing the need for eye drops.

donating prostaglandins, novel combination drops, and new delivery methods such as cationic exchange resins, punctal plugs (Figure 1), and micropumps.



**Dr. Ella Faktorovich, Director of Refractive and Corneal Surgery at Pacific Vision Institute** gave an update on medications used to treat corneal and external diseases. The use of all 4 fourth generation fluoroquinolones (FQ's) to treat bacterial conjunctivitis was discussed. Zymar (Gatifloxacin 0.3%) although discontinued by the manufacturer, may still be special ordered by the pharmacies. Zymaxid (gatifloxacin 0.5%), Vigamox (moxifloxacin 0.5%), and Moxeza (moxifloxacin 0.5% in Xanthan Gum) are also available. Besivance (besifloxacin 0.6%) is a newer 4th generation fluoroquinolone, that can also be used to treat bacterial conjunctivitis. All 4th generation fluoroquinolones have broad gram positive and gram negative coverage. This feature is helpful in treating corneal ulcers empirically, although this use of fluoroquinolones is off-label. Ulcers larger than 2 mm and central corneal ulcers are still best treated with fortified antibiotics.

New anti-virals, such as Zirgan (gancyclovir 0.15%) gel can be less toxic to corneal epithelium and can be used instead of Viroptic (trifluorouridine) to treat herpes simplex keratitis. Oral antivirals can be used instead of topical to treat HSV epithelial keratitis as well. Dr. Faktorovich also presented data

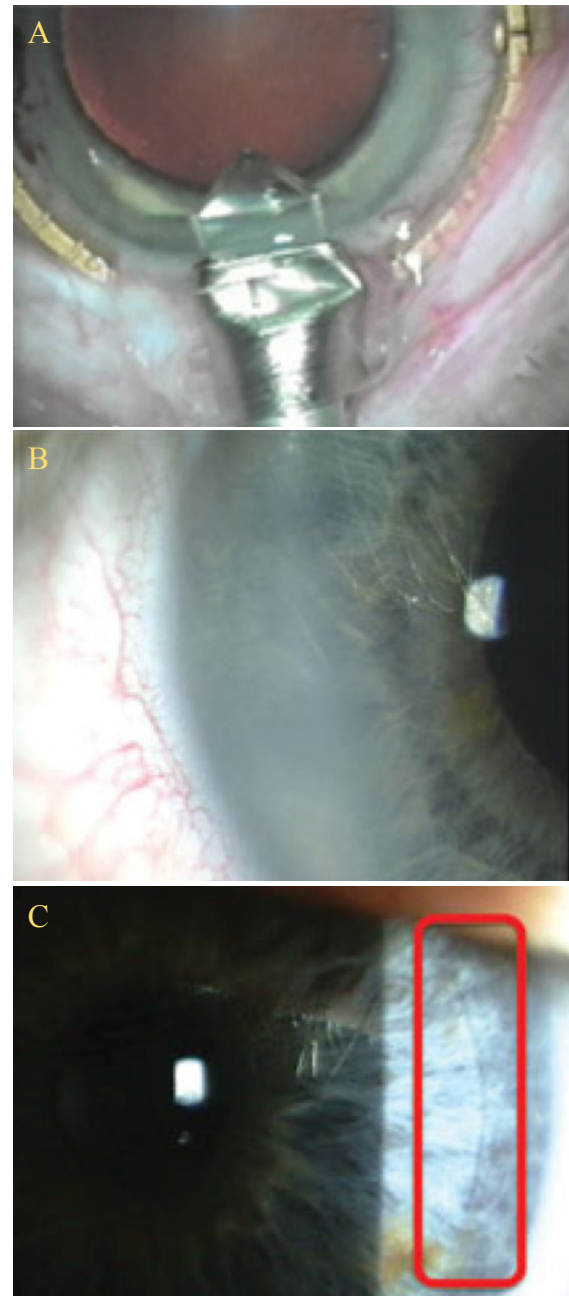
#### Availability of 4th Generation FQs in pharmacies

BRAND NAME	Availability in 5 pharmacies (3 Walgreens + 2 Costco's)
ZYMAXID	2/5 = have it in stock 3/5 = need to special order (at least a day)
VIGAMOX	5/5 = have it in stock
MOXEZA	2/5 = have it in stock 3/5 = need to special order (at least a day)
BESIVANCE	2/5 = have it in stock (but few) 3/5 = need to special order (at least a day)

to show that azithromycin can be an effective anti-inflammatory agent as well as an anti-infective. Therefore, it can potentially be used to treat staph marginal keratitis in addition to the lid disease.



**Dr. Neil Friedman, Director of Cataract and Lens Implant Surgery at Pacific Vision Institute**, presented an update on postop prophylaxis protocols for cataract, lens replacement, and lens implant surgery. He emphasized that the most important consideration in preventing postoperative complications is meticulously done surgery (Figure 2).



**Figure 2.** Meticulous construction and handling of the corneal incision in cataract and lens implant surgery is critical to safe surgical outcomes. (A) Corneal incision is created with special precision instruments. (B) Immediately after the lens surgery is completed, the incision is hydrated to secure it. (C) At one-day follow up, the incision is well-apposed and should hardly be visible. It should be Seidel negative.



Dr. Friedman highlighted the importance of using antibiotics, steroids and NSAIDs in the postoperative anti-infective and anti-inflammatory prophylaxis after cataract and lens replacement surgery. He described his most up-to-date medication protocols that include the newest, IOP sparing steroids, the latest antibiotics with the broadest gram + and gram - coverage, and the most conveniently dosed NSAIDs to improve patient comfort, prevent cystoid macular edema, and insure patient compliance.

### **PVI medications protocol after cataract and lens replacement surgery**

Although topical antibiotics are FDA approved for the treatment of conjunctivitis, they are used off-label prophylactically to prevent endophthalmitis. At PVI, we prefer to use Besivance after cataract and lens surgery because currently it may have the broadest spectrum of activity – an important feature when prophylaxing after intraocular surgery. It is only formulated as an ophthalmic medication so there is no systemic equivalent and therefore less risk of bacteria developing resistance. Furthermore, it is dosed tid which aids with patient compliance.

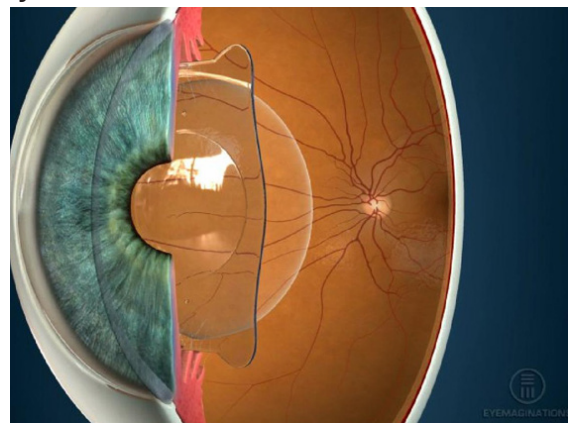
Steroids are the most potent anti-inflammatory agent but there are concerns about adverse effects such as elevated intraocular pressure, for example. We recommend patients administer a topical steroid for 4-8 weeks after cataract and lens implant surgeries depending on the patient's risk of developing CME (i.e., diabetes, uveitis, retinal vein occlu-

sion, epiretinal membrane). Therefore, we prefer to use the steroid that achieves the most balance between efficacy and safety, such as Lotemax. It was shown to be as effective as prednisolone acetate in treating acute anterior uveitis, and the risk of raising IOP greater than or equal to 10 mm Hg is only 1% (vs. 7% with prednisolone acetate).

For patients with significant corneal edema or inflammation, we use Durezol for the first 2 weeks and then change to Lotemax.

Topical NSAIDs are FDA approved for a 14 day course to reduce pain and inflammation following ocular surgery; however, these drugs are more commonly used for at least 4 weeks to reduce the risk of CME. All of the NSAIDs have been shown to be effective for treating and preventing CME, and studies show a synergistic effect when the NSAIDs are used in conjunction with steroids. At Pacific Vision Institute, we choose to prescribe Bromday because it is the only once a day topical NSAID and is thus the most convenient for patients especially when they are using multiple eye drops.

### **PVI medications protocol after phakic IOL lens implant surgery**

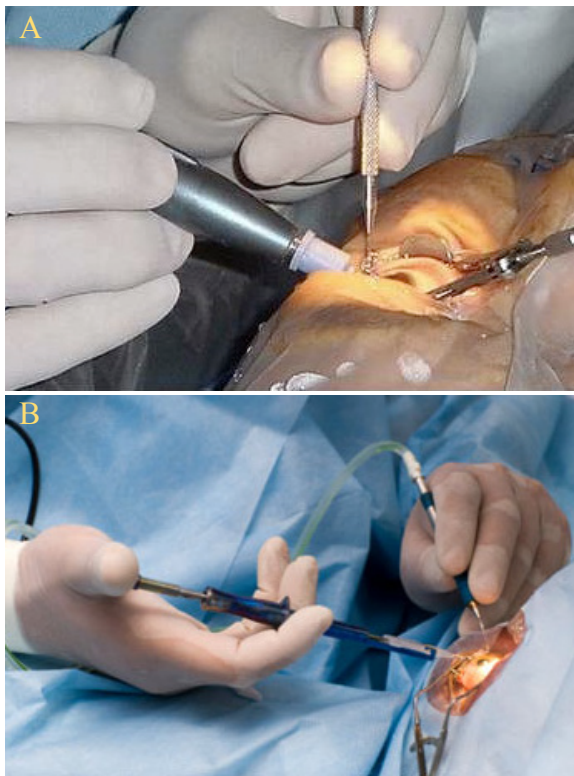


**Figure 4.** ICL phakic IOL is position between the iris and the crystalline lens

During ICL surgery, an ultra-thin lens is placed behind the iris. Patient's crystalline lens remains intact (Figure 4). Therefore, there is less chance of inflammation, cystoid macular edema, and infection compared to surgeries where the crystalline lens is removed. Nevertheless, we still recommend that patients are fully covered with the same medications as they are in surgeries where crystalline lens is replaced. We, therefore, have all our post-ICL patients use Besivance to prevent infection, Lotemax to prevent inflammation, and Bromday to prevent cystoid macular edema.

### **PVI medications protocol after LASIK**

An ounce of prevention is worth a pound of cure. To optimize the outcomes, sterile precautions during surgery are important (Figure 5).



**Figure 3.** Meticulous surgery in a strictly sterile environment is essential for safe surgical outcomes. (A) Phacoemulsification is performed to remove the crystalline lens. (B) Intraocular lens implant is placed into the capsular bag



**Figure 5.** Sterile gloves and gear are important during surgery. Sterile instrument environment is strictly maintained.

Postoperatively, at Pacific Vision Institute, we recommend using a 4th generation fluoroquinolone such as Zymaxid (gatifloxacin 0.5%) or Vigamox (moxifloxacin 0.5%) every two hours on the day of the procedure, followed by QID for a week. Fourth generation fluoroquinolones provide broad spectrum gram+ and gram- coverage of most common pathogens and give excellent postoperative anti-bacterial prophylaxis. While Moxeza (moxifloxacin 0.5% in Xanthan Gum) and Besivance (besifloxacin 0.6% in DuraSite) are also 4th generation fluoroquinolones, we recommend avoiding these antibiotics in post-LASIK patients because they are formulated in a thick vehicle that can migrate under the LASIK flap in the immediate postoperative period and potentially result in flap-related complications such as flap slippage and epithelial ingrowth.

We also recommend Pred Forte (prednisolone acetate 1%) every two hours on the day of the procedure, followed by QID for a week. While Lotemax (loteprednol 0.5%) can also be used, it doesn't have as long of a track record as prednisolone acetate in preventing postoperative corneal inflammation such as DLK, for example. We typically avoid Durezol (difluprednate) because of high intraocular pressure spikes observed with this potent steroid after only a brief use.

All patients are encouraged to use Refresh Plus every 1-2 hours during the day for the first several weeks after their procedure and Celluvisc at night. By 3-4 weeks postop, they can decrease the frequency of drops to four times a day and continue for several months after.

### PVI medications protocol after PRK

We recommend patients use Pred Forte (prednisolone acetate 1%) and Vigamox (moxifloxacin 0.5%) every two hours on the day of the procedure, followed by QID for 7 days. After 7 days, we stop the antibiotic and change the steroid to FML (Fluorometholone 0.1%) QID x 1 month,

followed by BID x 1 month.

During the first several days after PRK, patients may experience discomfort. Our study published last year in Journal of Refractive Surgery found that post-PRK discomfort peaks at day 2 after the procedure. This finding is consistent with other published studies. We, therefore, recommend that patients are covered with an analgesic medication during the first several days after the procedure. We recommend ibuprofen 600 mg Q6 hours and/or an oral opiate, such as Vicodin, Vicodin ES, or Percocet 1-2 tabs Q6 hours. We have also been using topical morphine 1% QID with excellent results. Topical morphine is a topical analgesic that does not effect corneal re-epithelialization. We typically don't use topical NSAIDS in the immediate post-operative period after corneal surgery because of potential adverse effect on epithelial healing.

	PVI Postop Medication Protocol
LASIK	<ul style="list-style-type: none"> <li>• Pred Forte 1% Q2 hrs on the day of procedure, then QID x 7 days after procedure</li> <li>• Vigamox Q2 hrs on the day of procedure, then QID x 7 days after procedure</li> </ul>
PRK	<ul style="list-style-type: none"> <li>• Pred Forte 1% Q2 hrs on the day of procedure, then QID x 7 days after procedure</li> <li>• Vigamox Q2 hrs on the day of procedure, then QID x 7 days after procedure</li> <li>• FML is started at one week after the procedure and continued QID x 1 month, followed by BID x 1 month</li> </ul>
ICL phakic IOL	<ul style="list-style-type: none"> <li>• Before procedure: start Besivance (TID) and Bromday QD 3 days prior to procedure</li> <li>• After procedure use the following regimen <ul style="list-style-type: none"> <li>• Besivance TID x 1 week</li> <li>• Bromday QD x 4 weeks</li> <li>• Lotemax QID x 2 weeks, then BID x 2 weeks</li> </ul> </li> </ul>
Refractive Lens Exchange (RLE)	<ul style="list-style-type: none"> <li>• Before procedure: start Besivance (TID) and Bromday QD 3 days prior to procedure</li> <li>• After procedure use the following regimen <ul style="list-style-type: none"> <li>• Besivance TID x 1 week</li> <li>• Bromday QD x 6 weeks</li> <li>• Lotemax QID x 2 weeks, then BID x 4 weeks</li> </ul> </li> </ul>
Cataract removal with IOL insertion	<ul style="list-style-type: none"> <li>• Before procedure: start Besivance (TID) and Bromday QD 3 days prior to procedure</li> <li>• After procedure use the following regimen <ul style="list-style-type: none"> <li>• Besivance TID x 1 week</li> <li>• Bromday QD x 4 weeks in patients with low risk of CME; x 6 weeks in patients who receive premium IOL; x 8 weeks in patients who are high risk for CME</li> <li>• Lotemax QID x 2 weeks, then BID x 2 weeks in patients with low risk of CME; QID x 2 weeks, then BID x 4 weeks in patients who receive premium IOL; QID x 4 weeks, then BID x 4 weeks in patients who are high risk for CME.</li> </ul> </li> </ul>





## QUIZ

1. The best procedure for a 29 year old -3D myope with 4D of astigmatism, 570 micron corneal thickness and normal topography is
  - a) LASIK
  - b) PRK
  - c) Phakic IOL
  - d) Refractive Lens Exchange
  - e) All of the above
  - f) None of the above

2. The ICL phakic IOL is placed where:
  - a) In the anterior chamber
  - b) Attached to the iris
  - c) In the ciliary sulcus
  - d) In the capsular bag



3. A multifocal IOL should not be used in a patient with
  - a) keratoconus
  - b) epiretinal membrane
  - c) macular degeneration
  - d) previous RK
  - e) All of the above
  - f) None of the above



## Become a PVI co-managing doctor



We welcome the opportunity to help your patients with refractive surgery, cornea, cataract, and lens implant considerations.

Please call us at [415-922-9500](tel:415-922-9500) to schedule a surgical consultation for your patients.

You can also e-mail us at [comanagement@pacificvision.org](mailto:comanagement@pacificvision.org) if you have any questions.

## QUIZ ANSWERS

1. A – LASIK. Laser vision correction is approved for patients with astigmatism up to 6 diopters. Both LASIK and PRK can be performed with excellent outcomes. Careful alignment of the eye in a reclined cyclotorted position is needed to make sure astigmatism correction is performed on-axis. In this patient, the corneal thickness is adequate for the amount of correction and the topography is normal. The patient will do very well with LASIK. We expect postoperative uncorrected vision to be 20/20 or better if preoperative best-corrected vision was 20/20 or better.
2. C - in the ciliary sulcus. The ICL or Visian lens is placed in the ciliary sulcus between the iris and the lens. This is the most physiologic location for a phakic IOL.
3. E – all of the above. Any condition that produces irregular astigmatism, reduced visual acuity, or decreased contrast sensitivity is a contraindication for using a multifocal IOL. If these patients desire both good distance and near vision, they may be candidates for Crystalens rather than multifocal IOL.

## Sight Gags by Scott Lee, O.D.



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