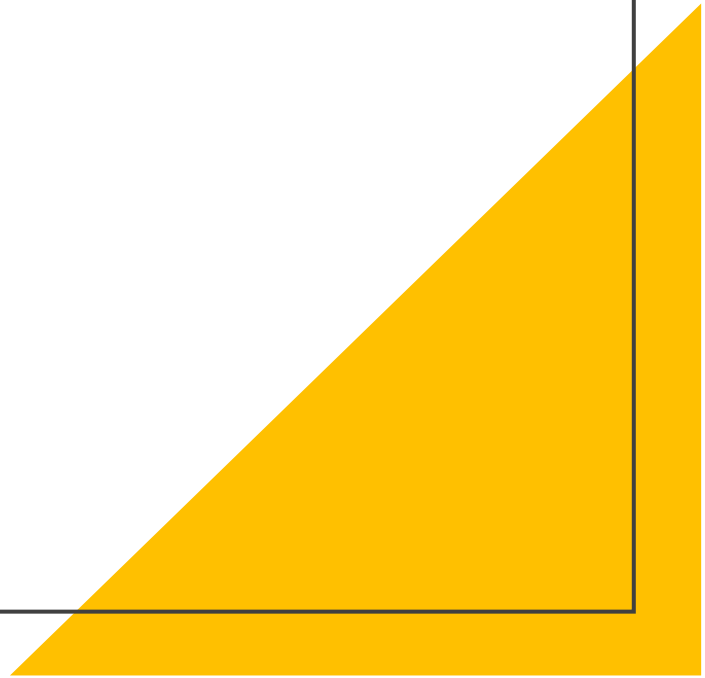# Current Pharmacology in Cataract Surgery

Alan C. Parent, MD, FACS

Cataract and Eye Consultants of Michigan

Technological Advances Last 30 Years

- Wound architecture
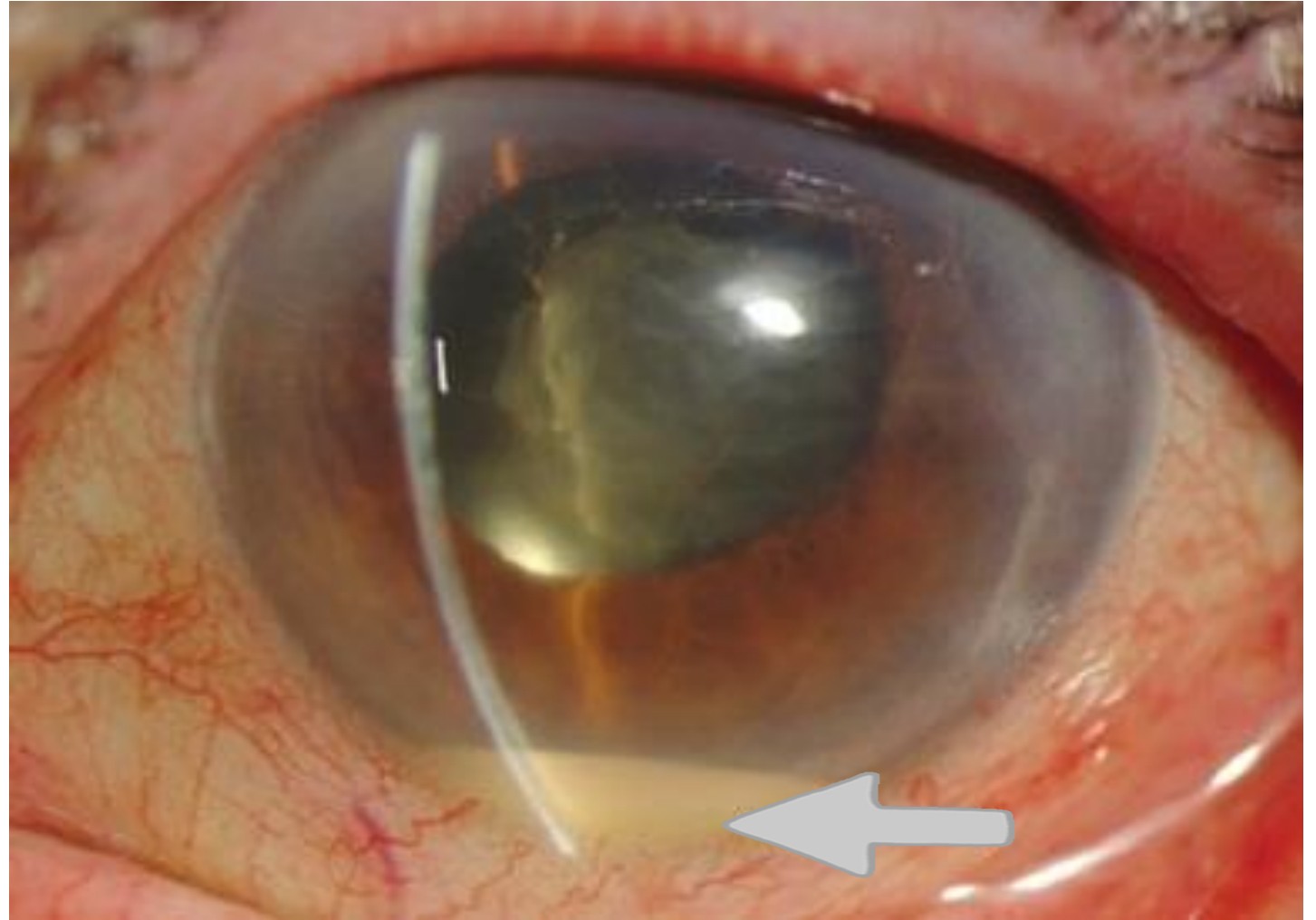- Biometry and formulas
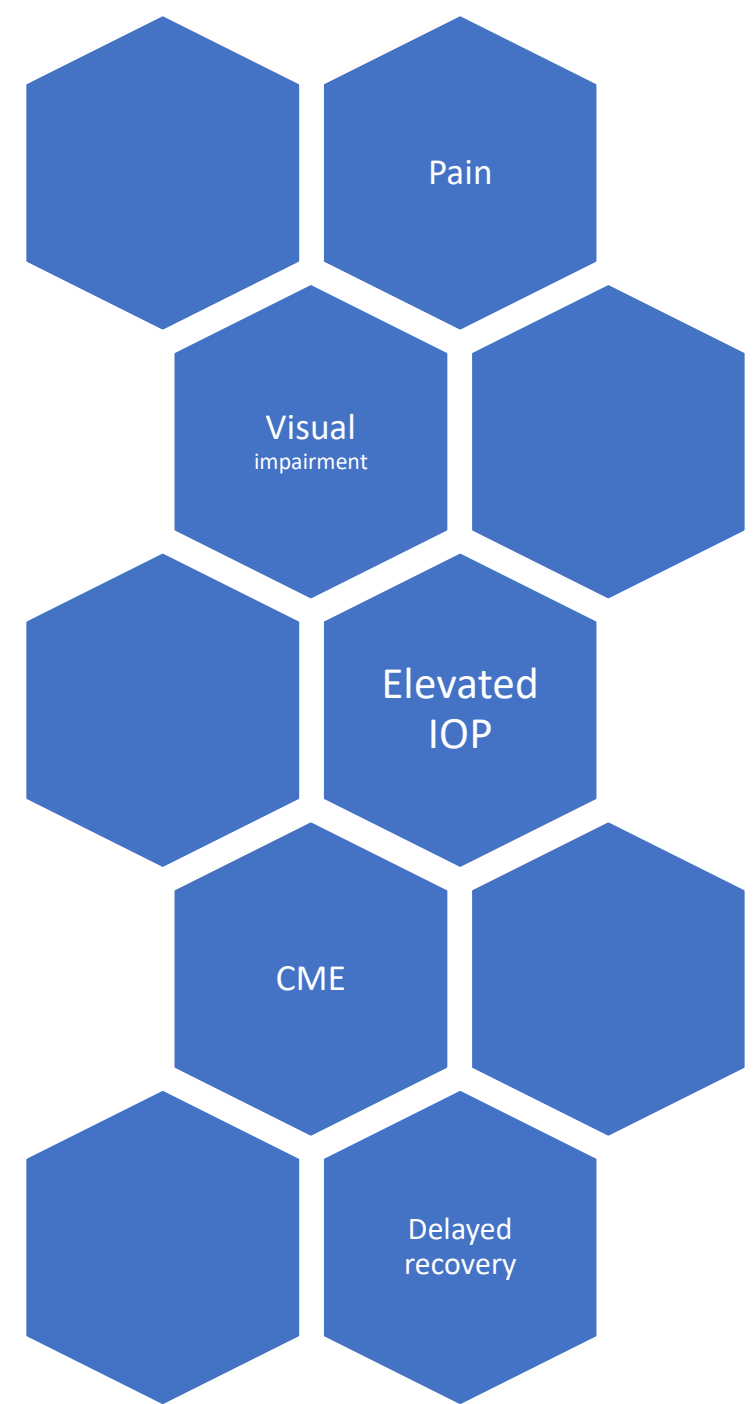- IOLs
- Phacoemulsification
- Fluidics
- OVDs
- ????? Pharmacology

Infection Prevention

Endophthalmitis

Rare, but devastating

Ocular Inflammation

Pain

Visual impairment

Elevated IOP

CME

Delayed recovery

Current Cataract Pharmacology

Drops   "Dropless"   Less Drops

Why Drops Are NOT Ideal

Compliance - Glaucoma studies show < 50% adherence
Bioavailability
Toxicity
Expense
Caregiver Burden
Practice Burden
Patient Burden - Canadian study: 92.6% improper admin technique[1]

1. An JA, Kasner O, Samek DA, Levesque V. Evaluation of eyedrop administration by inexperienced patients after cataract surgery. J Cataract Refract Surg. 2014;40(11):1857-1861.

Drops and Infection Control

No evidence that topical agents are effective at preventing or reducing infection[2]

Only topical agent effective: Povidone Iodine[3]

2. American Academy of Ophthalmology Cataract in the adult eye preferred practice pattern. San Francisco, CA:American Academy of Ophthalmology; 2016.
3. Ciulla TA, Starr MB, Masket S. Bacterial endophthalmitis prophylaxis for cataract surgery: an evidence-based update. Ophthalmology 2002; 109:13–24.

Antibiotic Injection

- Ensures delivery = NO compliance issues
- More convenient
- Safe and Effective[4]

Barry P, Seal DV, Gettinby G, et al. ESCRS study of prophylaxis of postoperative endophthalmitis after cataract surgery: preliminary report of principal results from a European multicenter study. J Cataract Refract Surg 2006; 32:407–410.
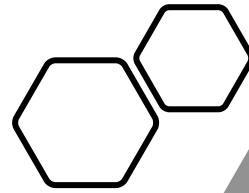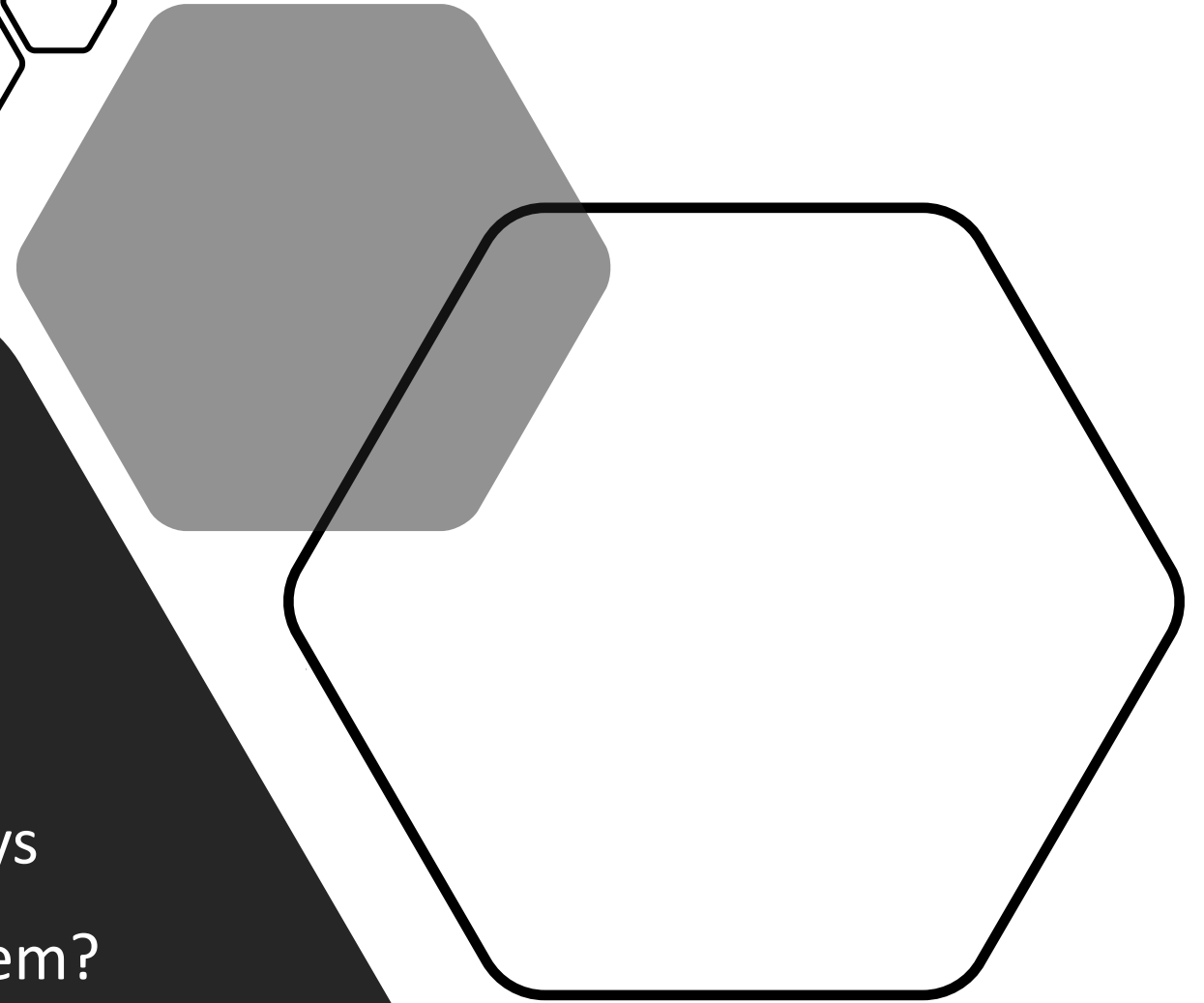
Why is it Not Standard of Care in the US?

Universal adoption of intracameral antibiotic use in the US is likely hindered in part by safety and medico-legal concerns related to the absence of an antibiotic formulation developed and approved specifically for intracameral use. The development and commercialization of such an agent in the US faces significant hurdles due to the complexity of the regulatory pathway and the high cost of such a study.
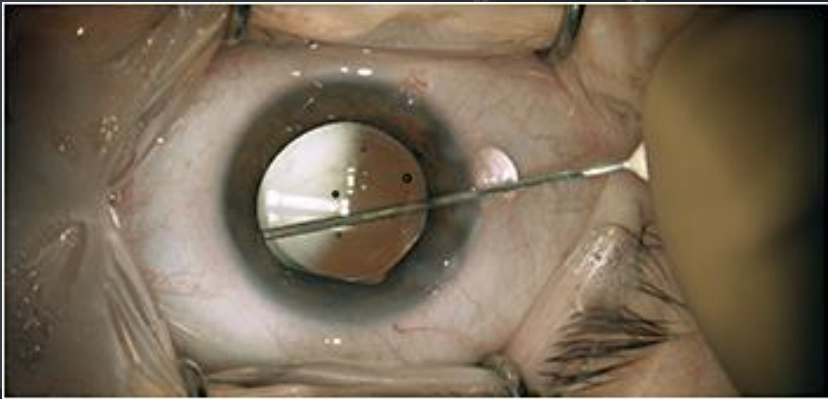
Inflammation

- Steroid

- NSAID

- Need both: 2 inflammatory pathways

- What is most effective delivery system?

Transzonnular Injection

"Dropless" technique
- Triamcinolone and Moxifloxacin

What about the NSAID??

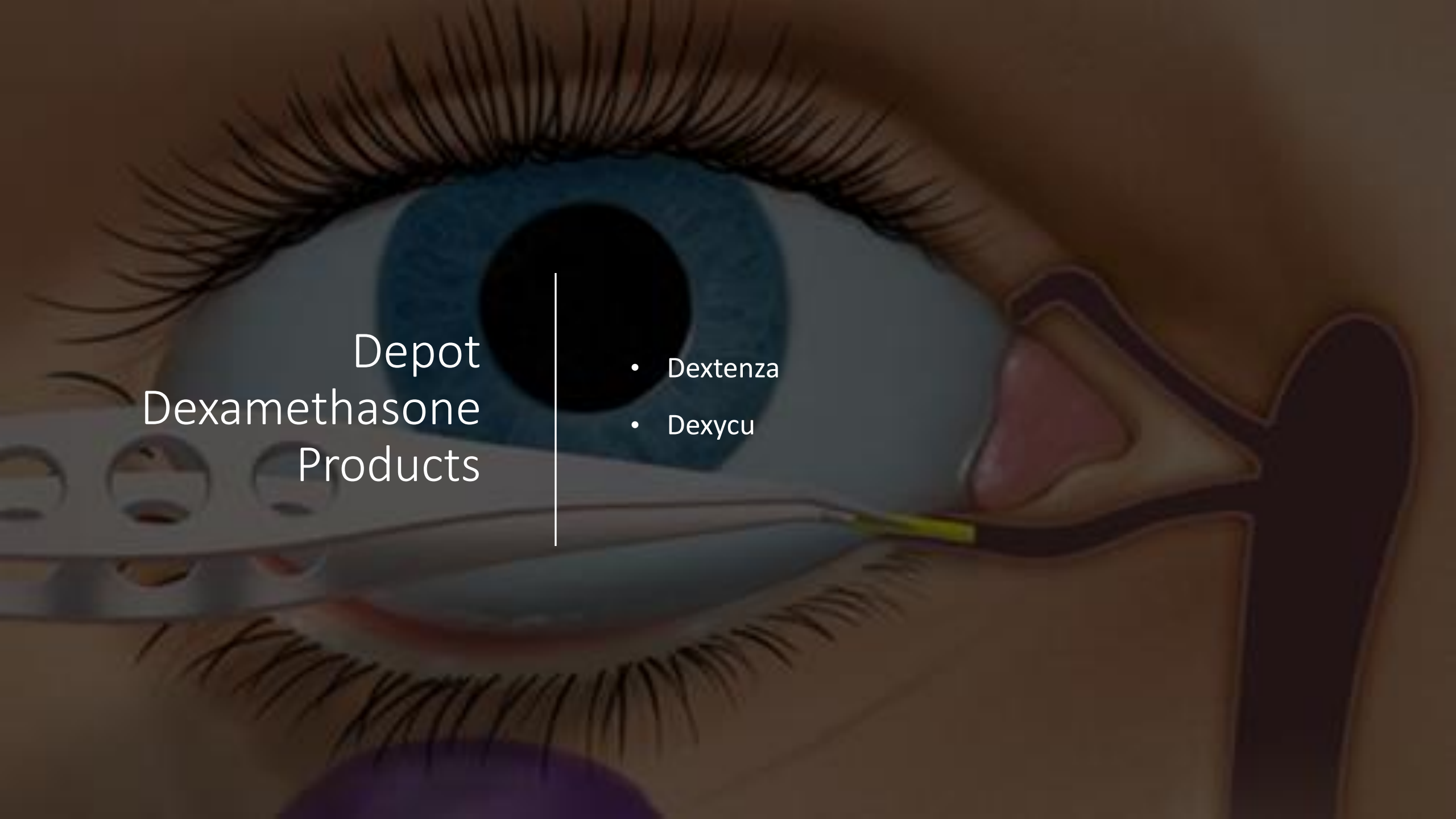Often need to add a topical steroid

Marketing ploy

Other "Dropless" Downsides

Reduced vision from suspension

- ie FLOATERS

Possible zonular damage → IOL decentration

IOP spikes

Depot
Dexamethasone
Products

- Dextenza
- Dexycu

Dextenza

ACTIVATES
- With moisture and swells to fit securely in the canaliculus

RELEASES
- Dexamethasone for up to 30 days

RESORBS
- Slowly through the cou[rse of] treatment and clears v[ia] nasolacrimal duct

- Rod-shaped depot of 0.4mg dexamethasone
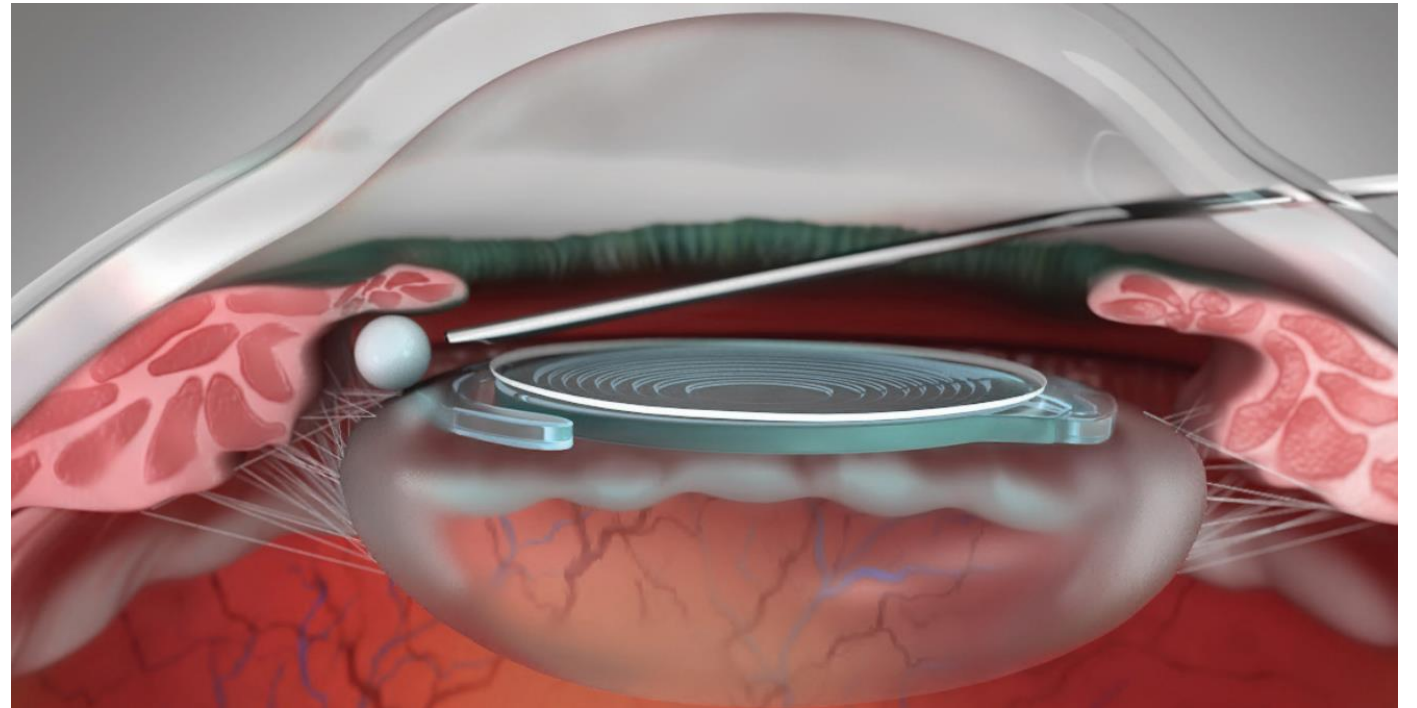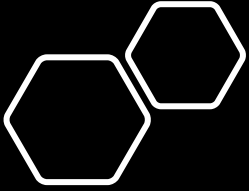- Inserted into the punctum
- Releases tapered dose for 30 days

Dexycu

Intraocular suspension of dexamethasone 103.4mg/ml

Place 0.005ml into the posterior chamber

Downside of Depot Dexamethasone

IOP spike

Still need NSAID!!!!!

Expensive ($594-$785.99)

What About NSAIDS??

Kaiser study- 16,070 cataract surgeries. Adding NSAID to steroid reduced rate of CME by half

PREMED study- Evaluated the role of steroids and NSAIDS in preventing postoperative CME after cataract surgery. Patients were treated with Bromfenac 0.09%, Dexamethasone 0.1%, or the combination of both [97]. Postoperative macular thickness was significantly lower (P = 0.002) and CME less common (P = 0.003) at 12 weeks in the combination group compared with the dexamethasone-only group

Less Drops Approach

Antibiotic injection combined with steroid/NSAID combination drop

One bottle = better compliance

No generic substitutes

Cost savings and less calls!!!

Convenient

Less risk

Summary

Modern cataract surgery comes with high patient expectations

- Advances in pharmacology have NOT kept up with surgical technique

- Antibiotic injection greatly reduce risk of infection

- Depot steroids are expensive and dangerous

- Still need an NSAID!!!

Thank You

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