Subconjunctival Kenalog for better post-op cataract inflammation control with no higher risk of glaucoma events

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| Challenge | **Self-administration of anti-inflammatory eyedrops post-cataract surgery is difficult for geriatric patients, requiring hundreds of drops over several weeks. An alternative one-time injection may improve compliance, enhance effectiveness, and decrease pharmacy & staff resources though direct comparisons with the standard drops are lacking.**  |
| Existing Evidence | Injecting long-acting steroids at the time of cataract surgery to decrease postoperative inflammation following cataract surgery, instead of post-surgical self-administered drops, is currently utilized in some settings. In 2008, some KPNC surgeons began to inject 2 mg (0.05 mL) of triamcinolone acetonide (TA) (Kenalog, Bristol-Myers-Squibb) 40 mg/mL in the subconjunctival space 4 mm inferior to the inferior limbus, though with some ambiguity regarding effectiveness and side-effect profile. Building on this published KPNC experience, some KPNC surgeons adopted an injection regimen of 0.4 mL of TA 10 mg/mL (4 mg), 6-8 mm inferior to inferior limbus. Anecdotally, fewer eyes were observed with postop macular edema and IOP elevations than prior regimens. This depot is typically visible and active for 8 (or up to 12 weeks) in the post-op period; thus, it can provide durable anti-inflammatory effects that might replace self-administered drops. |
| Target Population | Routine cataract surgery patients without history of glaucoma, high myopia, history of herpetic eye disease or age < 65 years |
| Intervention or Exposure | 4mg subconjunctival injection of Kenalog 10mg/mL 6-8mm inferior to the inferior corneal limbus, compared with similar patients who utilize post-operative drop-based therapy. |
| **Outcomes/Key Findings** | **Injection of 4mg of 10mg/mL Kenalog, compared with topical drop-based steroids (with or without topical NSAID), was associated with:*** **lower odds of postop macular edema**
* **similar odds of rebound iritis**
* **similar odds of a glaucoma-related event, including IOP rise**

Higher strength Kenalog 40 mg/mL, was associated with lower odds of postop macular edema, but had statistically higher odds of a postop glaucoma-related event, limiting the value of this formulation compared with the alternative dosing regimen.A subconjunctival injection of 4mg TA 10 mg/mL Kenalog, appears to offer benefits and a side effect profile comparable or superior to drop-based therapy, without requiring patient-initiated adherence, pharmacy-related dispensing, etc.  |
| **Resulting Action/Change** | **These results recommend broad use, after cataract surgery in KPNC, of 0.4mL of triamcinolone acetonide (Kenalog®) 10 mg/mL (4 mg) injection ≥6 mm inferior to inferior corneal limbus in eligible patients (see target population above), replacing drop-based therapy for post-operative prophylaxis against inflammation.** |
| Additional Recommendations | Patients receiving injection should be monitored in the postop period for increased intraocular pressure and premature dissolution of the steroid depot issues; patients still using drops should be monitored for compliance.  |
| Implementation Tools  | Value Based Unit at KP National Product Council will help disseminate this information. |
| Implementation Measurement | Monitoring of triamcinolone adoption of triamcinolone by service area and surgeon, post-operative complication rates for electronically available variables. |
| Reference | Manuscript under review by *Ophthalmology* March 2024 |

**Multivariable adjusted models:**

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| **Glaucoma Event** | **Odds Ratio****(95% CI)** | **P value** |
| PA | Ref |  |
| **PA + NSAID** | **1.18 (1.05,1.32)** | **0.004** |
| **TA 10 mg/mL low dose** | **0.69 (0.55,0.86)** | **0.001** |
| TA 10 mg/mL high dose | 0.90 (0.70,1.15) | 0.399 |
| TA 40 mg/mL low dose | 1.46 (0.98,2.18) | 0.062 |
| **TA 40 mg/mL high dose** | **2.14 (1.36,3.37)** | **0.001** |
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| **Macular Edema** | **Odds Ratio****(95% CI)** | **P value** |
| PA | Ref |  |
| PA + NSAID | 0.88,(0.74,1.04) | 0.135 |
| TA 10 mg/mL low dose | 0.75,(0.53,1.06) | 0.106 |
| **TA 10 mg/mL high dose** | **0.64,(0.43,0.97)** | **0.033** |
| TA 40 mg/mL low dose | 0.68,(0.36,1.30) | 0.246 |
| TA 40 mg/mL high dose | 0.51,(0.17,1.47) | 0.211 |
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| **Iritis** | **Odds Ratio****(95% CI)** | **P value** |
| PA | Ref |  |
| PA + NSAID | 1.17 (0.94,1.47) | 0.16 |
| TA 10 mg/mL low dose | 0.82 (0.54,1.26) | 0.367 |
| TA 10 mg/mL high dose | 0.99 (0.61,1.62) | 0.977 |
| TA 40 mg/mL low dose | 0.55 (0.16,1.95) | 0.358 |
| TA 40 mg/mL high dose | 0.25 (0.02,3.03) | 0.274 |