

# Posterior Capsule Opacification (PCO) Inhibitors: Present needs and future challenges

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## Background



- **What is PCO and how is it treated?**
- Mechanism: Residual lens epithelial cells transition to a myofibroblastic cell phenotype and migrate centrally across the capsule causing wrinkling and opacification
- Aldose reductase inhibitors have been shown to suppress this process of epithelial to mesenchymal transition (EMT) in mouse models of cataract surgery
- **The purpose of this study** is to assess cataract surgeons' opinions regarding whether there is an unmet need for a preventative PCO therapy that can be administered intraoperatively, and their willingness to adopt such a therapy, together with their perceptions of the major obstacles and benefits of introducing it into clinical practice

## Methods

- A survey questionnaire was administered via REDcap from August to December of 2020
- Adult, pediatric, and veterinary cataract surgeons were recruited from various practice settings
- Participation was voluntary anonymous, and uncompensated
- Some items on the questionnaire prompted an open-ended response, while others contained guided checkbox answers with the option to add commentary
- Mixed quantitative and qualitative analysis was performed to determine surgeons' viewpoints toward introducing a preventative PCO therapy to the cataract surgery market

## Results

Number of Responses	Surgeon Type		
	Adult (n=45)	Pediatric (n=42)	Veterinary (n=74)
% that indicated there is an unmet need for preventative PCO therapy	78% (n=35)	88% (n=37)	96% (n=71)
% interested in using an intraoperative preventative PCO therapy if one were available	98% (n=44)	98% (n=40)	95% (n=69)

**Potential benefits** of preventative PCO therapy endorsed by adult, pediatric, and veterinary surgeons.

Perceived Benefit	% in agreement
<b>Surgeon type: Adult</b>	
- Fewer complaints related to PCO	80%
- Use in developing countries that lack access to YAG laser	80%
- Eliminating potential complications related to YAG laser	67%
- Reducing the probability of needing YAG laser	62%
- Differentiate services offered from peers	44%
- Potential to generate more revenue	36%
- Other potential benefits	18%
<b>Surgeon type: Pediatric</b>	
- Potentially avoiding additional surgical procedures	98%
- Use in developing countries that lack access to YAG laser	81%
- Reducing complications from current management techniques	66%
- Reducing the probability of developing PCO	66%
- Potential to generate more revenue	10%
- Other potential benefits	7%
- Differentiate services offered from peers	5%
<b>Surgeon type: Veterinary</b>	
- Can provide a viable solution for PCO in pets	85%
- Reassure owners that pets will be less likely to develop PCO	78%
- Potential to generate more revenue	24%
- Differentiate services offered from peers	20%
- Other potential benefits	7%

**Potential obstacles** to adopting a preventative PCO therapy identified by adult, pediatric, and veterinary surgeons

Perceived Obstacle	% in agreement
<b>Surgeon type: Adult</b>	
- Insurance companies may not reimburse	91%
- Out of pocket cost	84%
- Potential complications or side effects	62%
- Reimbursement may be lower than YAG laser	58%
- Unknown efficacy	58%
- Other potential costs or obstacles	7%
<b>Surgeon type: Pediatric</b>	
- Potential complications or side effects	83%
- Unknown efficacy	76%
- Out of pocket cost	67%
- Insurance companies may not reimburse	67%
- Reimbursement lower than current management techniques	43%
- Other potential costs or obstacles	5%
<b>Surgeon type: Veterinary</b>	
- Potential complications or side effects	81%
- Unknown efficacy	76%
- Out of pocket cost	47%
- PCO is not a significant problem in pets	16%
- Other potential costs or obstacles	5%

Additional points highlighted by respondents:

- In pediatric patients who are not old enough to sit at the YAG laser, the efficacy needs to be 100% to favor a novel preventative therapy over a posterior capsulotomy routinely performed at the time of cataract surgery. A lower efficacy may be acceptable in patients who are old enough to receive YAG laser.
- Veterinary surgeons would accept a lower minimum efficacy since animals rarely undergo YAG laser for management of PCO.
- Preventative therapy offers the advantage of posterior capsule preservation which allows for easier and less risky intraocular lens (IOL) exchange.
- Appealing to include preventative PCO therapy in premium IOL packages since even a small amount of PCO can distort the optics of multifocal lenses
- Contraction of the capsular bag can cause the IOL to tilt (IOL tilt syndrome), inducing significant refractive error, even if the IOL was initially placed perfectly.

## Conclusions and Implications

- Cataract surgeons in all three groups overwhelmingly recognize an unmet need for preventative PCO therapy and support its development
- Clinical trials on human and animal subjects to evaluate the safety and efficacy of specific pharmacologic agents will play a critical role in bringing PCO inhibitors closer to surgical practice

## Disclosures

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