



Intraoperative Eye Care: A DNP Project

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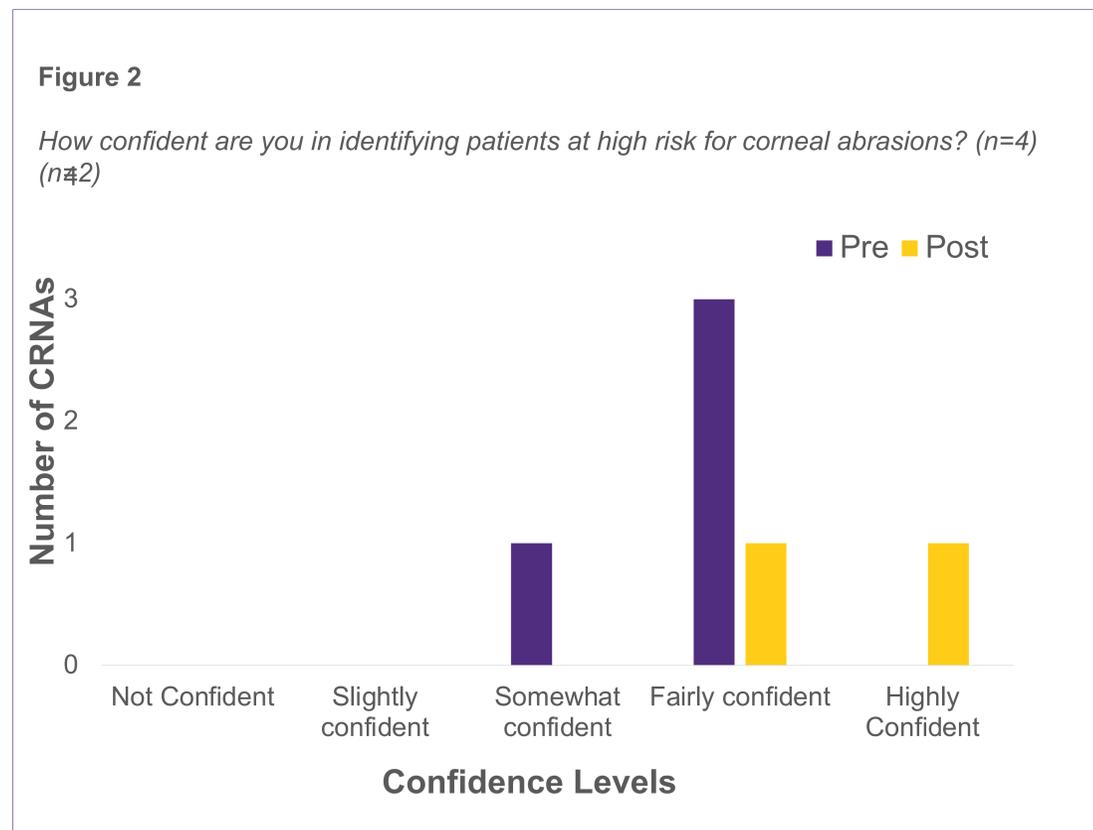
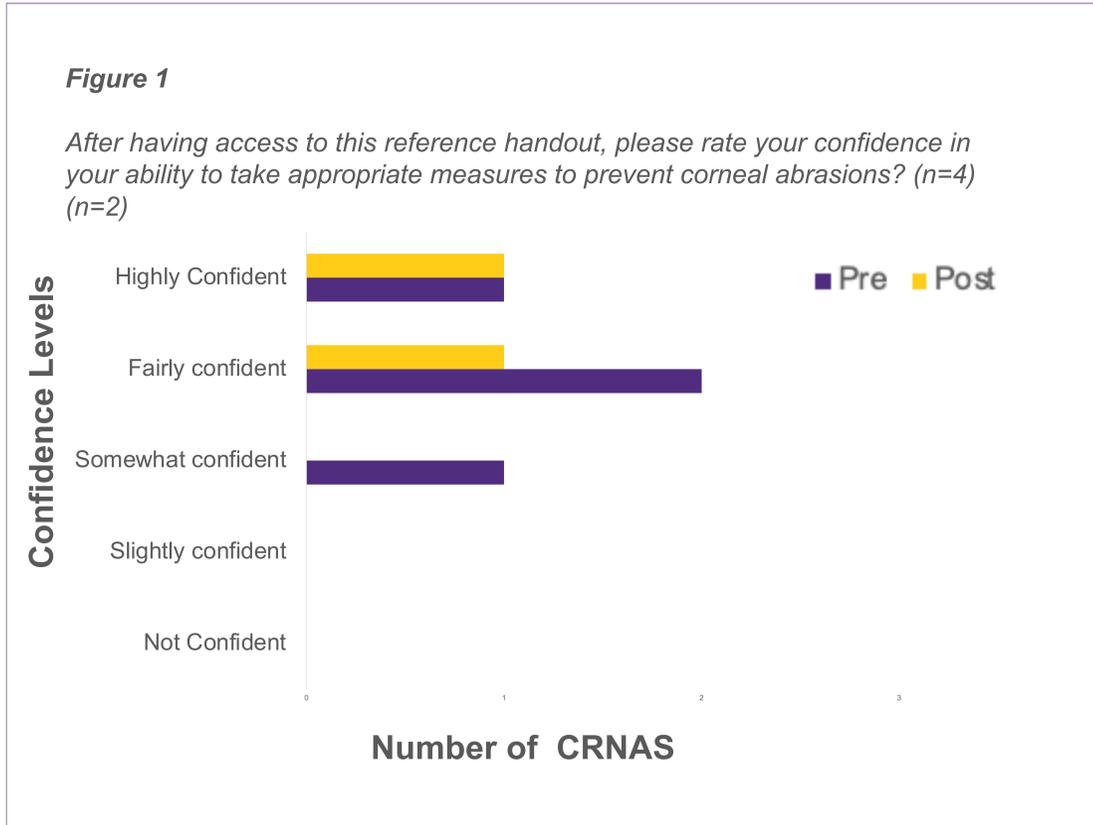
INTRODUCTION

- Corneal abrasions, are the most common optic injury that occurs in anesthesia practice.
- Account for approximately 2-3% of all anesthesia malpractice suits (Malafa et al., 2016).
- No specific protocol or documentation requirements for preventing corneal abrasions during surgical procedures
- Unclear what preventive efforts and guidance are being utilized by anesthesia providers at the partnering facility.
- Purpose of this quality improvement project was to assess CRNAs' knowledge, preferences, and practices regarding eye care and corneal abrasion prevention and whether or not they perceived a corneal abrasion quick reference guide as a useful tool for their practice to prevent and treat perioperative corneal abrasions.

METHODS

- Pre- and post-intervention design using a single PDSA cycle.
- The intervention used was a quick reference guide developed by the team with the most up to date literature on perioperative corneal abrasion recognition, prevention, diagnosis, and treatment.
- Anesthesia providers at the partnering organization were emailed an invitation to participate with a link to a pre-intervention Qualtrics survey and the attached intervention with requests that they complete the pre intervention survey prior to reviewing and using the guide.
- After two weeks of utilization, data was gathered using post surveys through Qualtrics to study whether the intervention increased knowledge on corneal abrasion prevention or changed the practice/ attitudes of anesthesia providers when pertaining to perioperative eye care.

RESULTS



DISCUSSION

- 4 CRNAs completed the pre-intervention survey, and 2 completed the post intervention survey
- 50% of CRNAs reported either they or a known colleague had been involved in a case with a patient who had received a corneal abrasion
- All respondents reported using clear one inch tape routinely for perioperative eye care
- An increase in confidence in the ability to identify risk factors for corneal abrasions, take appropriate measures to prevent corneal abrasions, and to assess, diagnose, and treat corneal abrasions was observed after use of the reference guide.

CONCLUSIONS

- This project has the potential to reduce occurrence of corneal abrasions in patients by making providers more aware of the risk factors as well as prevention techniques.
- Avoidable pain, infections, and longer hospital stays could be reduced by employing this project.
- A limitation of the project is a small sample size
- A larger scale project could be replicated with more hospitals and anesthesia providers that could result in more useful data.
- Use of an EPIC shortcut that would enable streamlined documentation for eye protection strategies utilized during the case was noted as a tool that would be considered beneficial according to survey results. Future projects could be directed in this manner.

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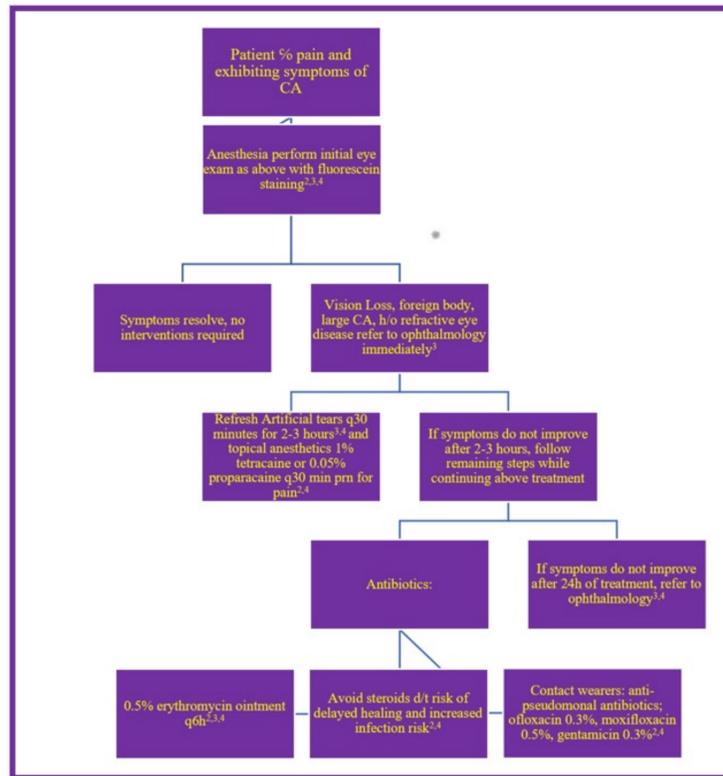
How do you tape your patients' eyes shut? Horizontal vs Vertical?



Interventions

- Secure eyelids with tape immediately after loss of lid reflex on induction and prior to securing the airway (Sundar)
 - The tape should be placed horizontally across the entire lid line. (Sundar, Grixti)
 - Use of Tegaderm to secure eyes in high risk cases^{1,4}. Tegaderm is water-tight and can prevent chemical injury with surgical prep solutions on the face²
- Use preservative-free 4% methylcellulose-based ointment to lubricate the eyes when taping is undesirable^{1,4}
- Paraffin based lubricant can absorb highly soluble anesthetics like Halothane and cause irritation¹
- Petroleum ointments are flammable - avoid with high FiO₂ and electrocautery near the face²
- Remove tape from upper to lower lid to reduce risk of mechanical trauma²

Stepwise Treatment Protocol



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Risk Factors:

- Advanced Age^{1,2,3,6}
- SRNA as provider^{1,5}
- Head and neck surgery^{2,5}
- Graves' disease/exophthalmos^{2,5}
- Lateral/prone/trendelenburg position^{1,2}
- Prolonged surgery duration > 3.5 hours⁶
- Robotic surgery cases⁶
- Diabetes¹
- Low ASA status¹

Incidence/Litigation

- One of the most common malpractice cases (4%)
- 2% of all malpractice claims
- Incidence of CAs 0.64% overall⁶
- CAs account for 35% of all ocular injury claims and awards for ocular injuries are 4% higher than any other claim⁶

Sources of CAs:

- Identification badges^{1,4}
- Stethoscopes¹
- Laryngoscopes^{1,4}
- Oxygen facemasks^{1,2,4}
- Pulse oximeter probe on dominant hand^{1,2,4}
- Watch band^{2,4}
- Surgical drapes^{2,4}
- Bair hugger²

Pathophysiology

- Corneal abrasions are superficial injuries to the epithelial layer of the cornea that cause pain, photophobia, excessive tearing, headache, and blurry vision.
- They normally heal within 72 hours but cause patients extensive, unanticipated discomfort in addition to their post-operative pain^{2,4}
- One fifth of these injuries occur from mechanical trauma such as scratching the eyes post-surgery or from objects such as oxygen masks, badges, and surgical drapes as well as chemical injuries from substances such as antiseptics². Other factors that add to the risk of corneal abrasions are foreign bodies, contact lens, and dry eyes².
- During general anesthesia, contraction of the orbicularis oculi muscle is inhibited therefore putting patients at increased risk for corneal abrasions due to insufficient closing of the eyelid and subsequent drying of the cornea².
- General anesthesia also inhibits blink reflexes, tear production, and what is known as Bell's phenomenon.
 - Bell's phenomenon is the upward and outward movement of the globe when the eyes close. The cornea stays more exposed during a threat without this reflex intact, contributing to injury.

Assessment and Diagnosis

- Initial assessment and treatments can be completed by an anesthesiologist
- Abrupt onset of eye pain, blurry vision, photophobia, excessive tearing, foreign body sensation within 2 hours of procedure^{2,4}
- R/o foreign body: evert eyelids to assess for any foreign body. If foreign body present irrigate with topical anesthetic^{2,4}
- Assess visual acuity, EOMs, pupil reactivity⁴
- Definitive diagnosis: fluorescein staining reveals yellow green staining of basement membrane in presence of corneal abrasion^{2,4}

