

Reducing the Incidence of Postoperative Corneal Irritation in Patients Undergoing Steep Trendelenberg Position for Robotic Assisted Laparoscopic Procedures through a Multifactorial Approach

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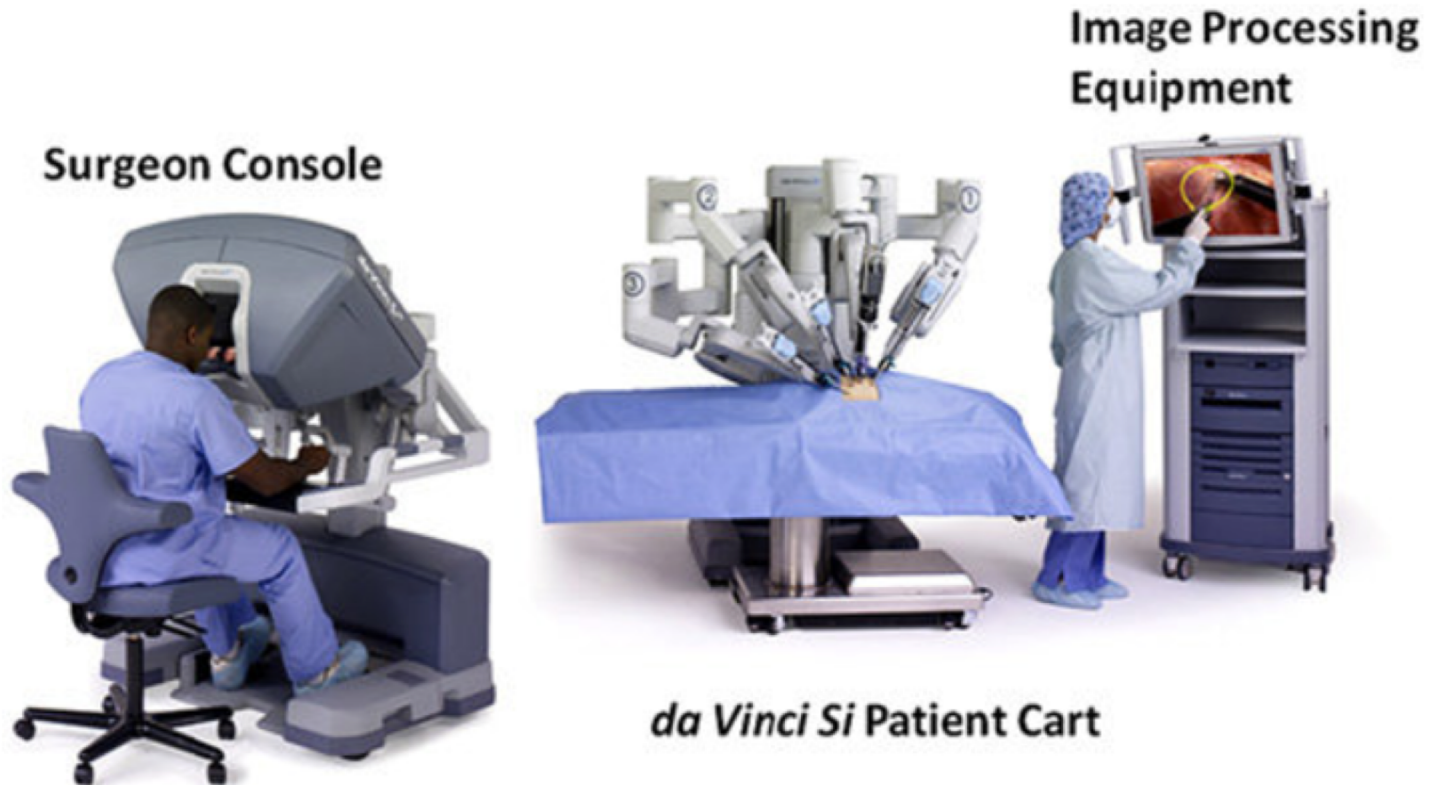
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OBJECTIVES

1. Discuss the unique prevalence of corneal abrasions (CA) in this population
2. Describe the implementation of an evidence-based practice to reduce corneal irritation
3. Summarize the results obtained after implementation of a new protocol

RALP PROCEDURES



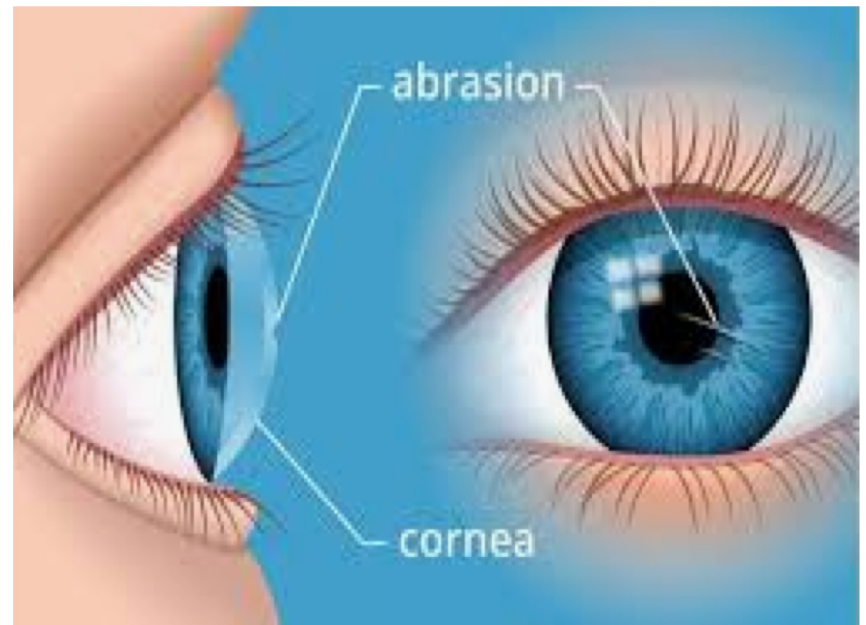
PATHOPHYSIOLOGY OF (CA)

CA: defined as traumatic injury to the epithelium of the eye.

Symptoms: pain, blurry vision, photophobia, and or foreign body sensation in the eye.

Causes:

- Corneal Exposure
- Mechanical Trauma
- Chemical Exposure



THE ST POSITION

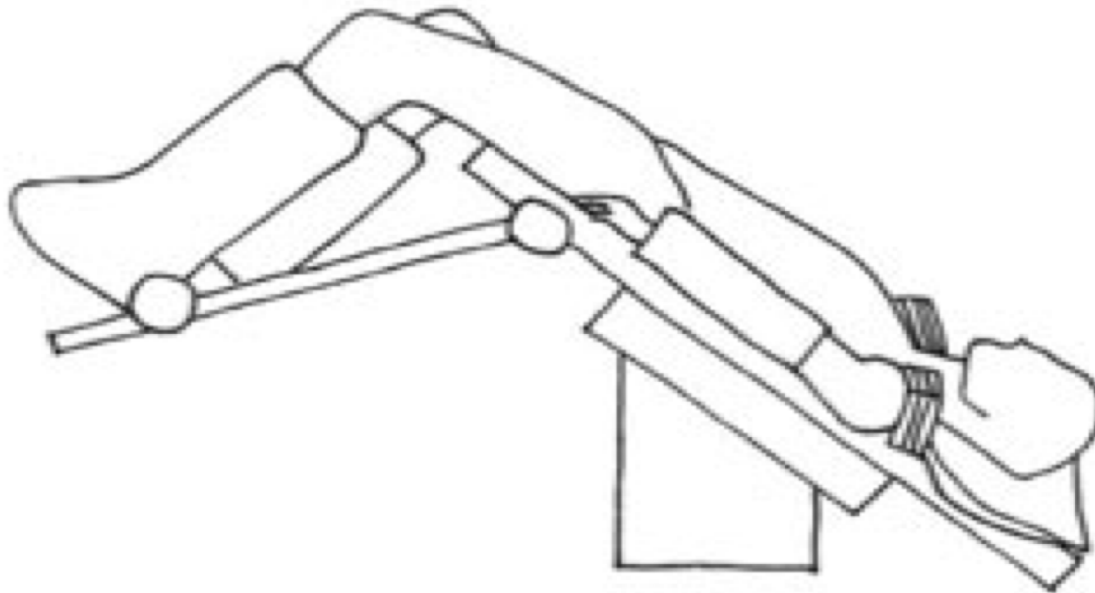


FIGURE 1: Trendelenburg position during RALRP, using shoulder braces. Also note that the patient's legs are supported away from the edge of the operating table and there is no pressure exerted against his calves by the leg-thigh hinge of the operating table.

SIGNIFICANCE OF PROBLEM

- Increasing use of robots for procedures
- Positioning in steep trendelenburg for robotic procedures
- This position presents providers with:
 - difficulty maintaining airway
 - decreases in lung volumes and capacities
 - facial edema
 - corneal irritation

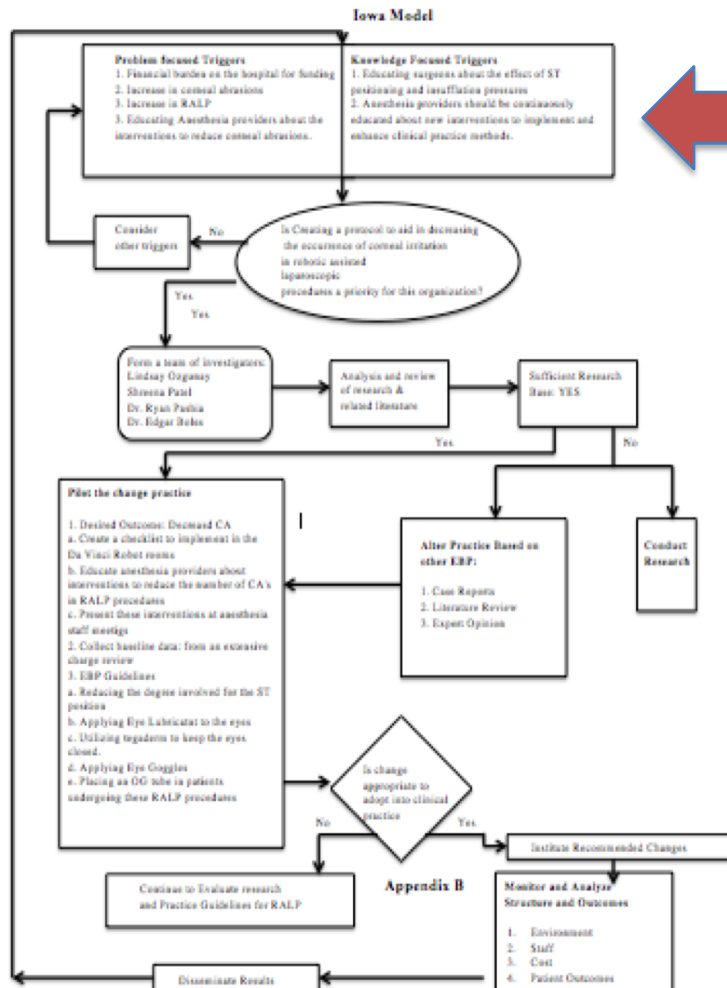


Blecha et al., (2017)

AIMS FOR THIS STUDY

1. Assessing the data surrounding the incidence of corneal irritation in procedures requiring robotic ST position.
1. Classifying and evaluating the incidence and etiology of resultant corneal irritations at a suburban community hospital.
1. Creating and implementing a protocol to help reduce CA in RALP.

THEORETICAL MODEL



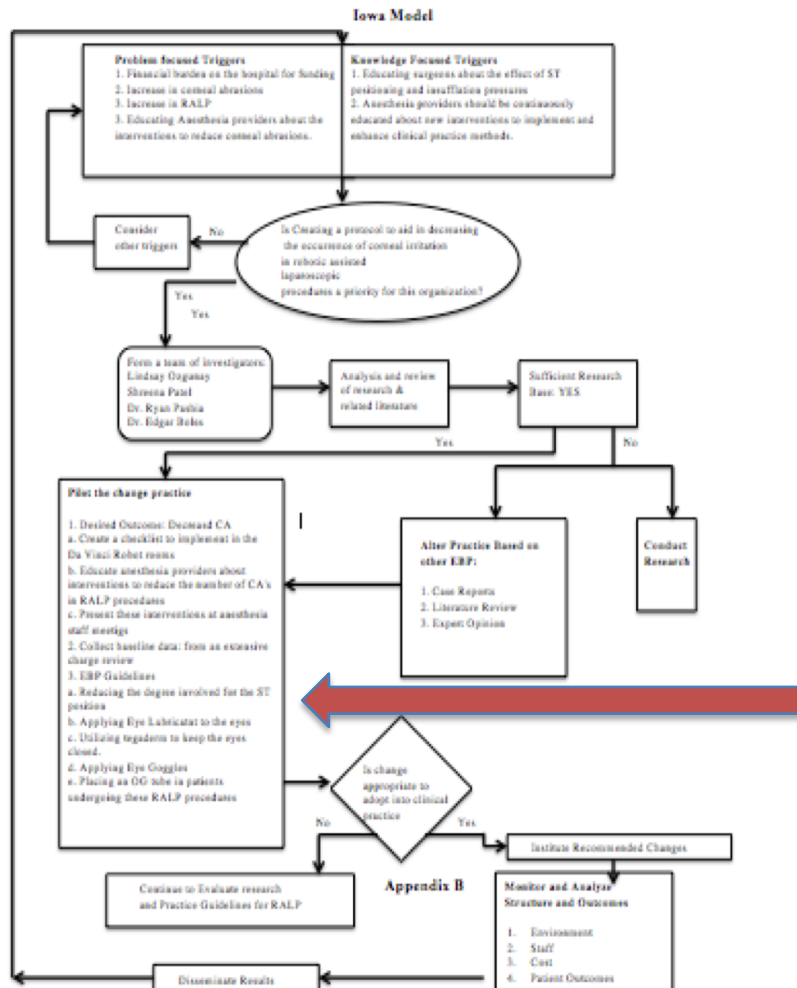
Problem Focused Triggers

1. Financial burden on the hospital for funding
2. Increase in corneal abrasions
3. Increase in RALP
4. Education anesthesia providers about the interventions to reduce CA

Knowledge Focused Triggers

1. Educating surgeons about the effect of ST positioning and insufflation pressures
2. Anesthesia providers should be educated about new interventions to implement and incorporate new methods in their clinical practice.

THEORETICAL MODEL



Pilot the change in practice

1. Desired Outcome: Decrease CA
 - a. Create a checklist to implement in the Da Vinci Robot rooms
 - b. Educate anesthesia providers about interventions to reduce the number of CA's in RALP procedures
 - c. Present these interventions at anesthesia staff meetings
2. Collect baseline data from an extensive chart review
3. EBP Guidelines
 - a. Reducing the degree involved for ST positioning
 - b. Applying Eye Lubricant to the eyes
 - c. Utilizing tegaderms to keep the eyes closed
 - d. Applying eye goggles
 - e. Placing and OG tube in patients undergoing these RALP procedures

BASELINE AUDIT

Extensive chart review done
utilizing Epic

Population: Charts reviewed
involved patients that
underwent RALP involving
prostatectomies and
hysterectomies.

Problem identified: the
occurrence of CA in RALP



IMPLEMENTATION

- Checklist presented to anesthesia department at monthly meeting.
- Utilization of checklist, placed in robot room
- Inservice given to anesthesia department
- Anesthesia providers encouraged to use recommended eye protection during cases
- Attempt made to add to EPIC, but unable to modify database.

CORNEAL IRRITATION PREVENTION STRATEGIES

- Interventions include applying eye lubricant to both eyes prior to taping the eyes shut
- Applying tegaderm to the eyes
- Utilizing eye goggles
- Placing an orogastric tube (OG)
- Limiting insufflation pressures to less than 20mmHg
- Limiting ST positioning

Sampat et al., (2015)

Segal et al., (2014)

DATA COLLECTION

Patient Identification Sticker

Robotic-Assisted Laparoscopic Procedure Corneal Abrasion Prevention Checklist

Date: _____

Ht: _____ Wt (kg): _____

Procedure: _____



Surgeon: _____

Responsible Anesthesia Personal: _____

Anesthesia Start: _____

Anesthesia End: _____

Please check off the interventions that have been done to prevent the occurrence of corneal abrasions:

- 
- 
- ☐ Eye lubricant used
 - ☐ Eyes secured with Tegaderm
 - ☐ Eyes secured with tape
 - ☐ Goggles placed on patient
 - ☐ Insufflation pressures (please check off the insufflation pressure that surgeon utilizes for this case)
 - ☐ 15mmHg
 - ☐ 16mmHg
 - ☐ 17mmHg
 - ☐ 18mmHg
 - ☐ 19mmHg
 - ☐ 20mmHg
 - ☐ > 20mmHg (please indicate) _____
 - ☐ Insertion of Nasogastric tube
 - ☐ Steep Trendelenburg Inclination (degree of Steep Trendelenburg): _____
 - ☐ Please checkoff this box if the surgeon has requested max Steep Trendelenburg

Please write down any other safety measures done for patient to prevent the occurrence of corneal abrasions:

We greatly appreciate your time and participation to help ensure that our patients are getting the best care and for implementing a few of these recommendations to help prevent the occurrence of corneal irritation in these Robotic-Assisted Laparoscopic Procedures.

BASELINE RESULTS

Total Charts Reviewed:

Hysterectomies- 311, % Occurrence- 0.02

Prostatectomies- 65, % Occurrence- 0.02

Table 1: Corneal Abrasion Incidence by Surgical Procedure-Baseline

Procedure	ASA	Length of Procedure
Robotic Assisted Laparoscopic Radical Prostatectomy	3	316 minutes
Robotic Assisted Laparoscopic Vaginal Hysterectomy with Cystoscopy	3	211 minutes
Robotic Assisted Laparoscopic Vaginal Hysterectomy with Bilateral Salpingectomy	2	290 minutes
Robotic Assisted Laparoscopic Vaginal Hysterectomy	2	184 minutes
Robotic Assisted Laparoscopic Total Abdominal Hysterectomy	3	141 minutes

POST IMPLEMENTATION RESULTS

Table 2: Occurrence of Corneal Abrasions Post Implementation

Procedure	Number of Surgeries	Corneal Abrasions
Robotic Prostatectomies	6	0
Robotic Hysterectomies	10	0

BARRIERS TO IMPLEMENTATION

- Support from pharmacy to supply the pyxis with eye lubrication ointment
- Decrease in the number of RALP procedures due to surgeons moving their population to other hospitals in the Midwest
- Support from the staff to adhere to protocol
- Production pressures preventing anesthesia providers from utilizing all of the interventions.

TRANSLATION INTO CLINICAL PRACTICE

- Evidence based practice recommendations include: that patients have their eyes lubricated and have a tegaderm placed over the eyes after induction, goggles placed over the patient's eyes prior to positioning, an OG tube placed to decompress the patient's stomach and to prevent gastric bile leaking into the patient's eyes.
- Other implementation practices include reducing the degree of ST position, and minimizing the amount of insufflation pressure utilized for this surgery
- Recommended insufflation pressure for RALP procedures is 20 mmHg, and it should not exceed this amount
- In September 2019, the results from this study were discussed at a departmental anesthesia meeting in another Midwest community hospital.

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QUESTIONS?

We thank you for your time and
attention.