

**REPORT DOCUMENTATION PAGE**

*Form Approved  
OMB No. 0704-0188*

The public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing the burden, to the Department of Defense, Executive Service Directorate (0704-0188). Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.

**PLEASE DO NOT RETURN YOUR FORM TO THE ABOVE ORGANIZATION.**

<b>1. REPORT DATE (DD-MM-YYYY)</b> 12/07/2017		<b>2. REPORT TYPE</b> Poster		<b>3. DATES COVERED (From - To)</b> 12/07/2017	
<b>4. TITLE AND SUBTITLE</b> Post-Photorefractive Keratectomy Scar Prevention				<b>5a. CONTRACT NUMBER</b>	
				<b>5b. GRANT NUMBER</b>	
				<b>5c. PROGRAM ELEMENT NUMBER</b>	
<b>6. AUTHOR(S)</b> Capt Soeken, Timothy				<b>5d. PROJECT NUMBER</b>	
				<b>5e. TASK NUMBER</b>	
				<b>5f. WORK UNIT NUMBER</b>	
<b>7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)</b> 59th Clinical Research Division 1100 Willford Hall Loop, Bldg 4430 JBSA-Lackland, TX 78236-9908 210-292-7141				<b>8. PERFORMING ORGANIZATION REPORT NUMBER</b>  17502	
<b>9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)</b> 59th Clinical Research Division 1100 Willford Hall Loop, Bldg 4430 JBSA-Lackland, TX 78236-9908 210-292-7141				<b>10. SPONSOR/MONITOR'S ACRONYM(S)</b>	
				<b>11. SPONSOR/MONITOR'S REPORT NUMBER(S)</b>	
<b>12. DISTRIBUTION/AVAILABILITY STATEMENT</b> Approved for public release. Distribution is unlimited.					
<b>13. SUPPLEMENTARY NOTES</b> 2017 Senior Leader Workshop, Leesburg, VA, 7 December 2017					
<b>14. ABSTRACT</b>					
<b>15. SUBJECT TERMS</b>					
<b>16. SECURITY CLASSIFICATION OF:</b>			<b>17. LIMITATION OF ABSTRACT</b>	<b>18. NUMBER OF PAGES</b>	<b>19a. NAME OF RESPONSIBLE PERSON</b>
a. REPORT	b. ABSTRACT	c. THIS PAGE			Clarice Longoria
					<b>19b. TELEPHONE NUMBER (Include area code)</b> 210-292-7141

## Introduction

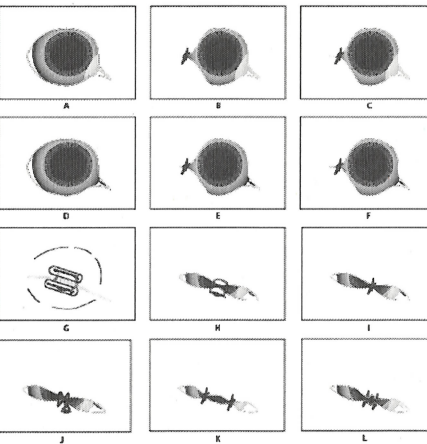
**BACKGROUND:**  
 -Corneal haze is a post-operative complication of PRK that can limit post-operative vision  
 -Contact lenses are utilized to minimize pain  
 -Medication compliance is often a complicating issue

**PRIOR STUDIES** with medicated contact lenses:  
 --Ciolino et al, 2011: Econazole  
 --Xu et al, 2011: Ketotifen  
 --Hyatt et al, 2012: Vancomycin and Gentamicin  
 --Jung et al, 2013: Timolol  
 --Ciolino et al 2014: Latanoprost  
 --Zhang et al, 2014: Meloxicam  
 --García-Millán et al, 2015: Triamcinolone acetonide  
 --Hsu et al, 2015: Timolol and Dorzolamide  
 --Hu et al, 2016: Ciprofloxacin

**PURPOSE:**  
 To compare the safety and efficacy of an experimental dexamethasone impregnated contact lens against the current standard of care

## Methods

Technique Development Stage	1	2	3	4
Week -1	Tarsorrhaphy Techniques (A) - (G)	n/a	n/a	n/a
Week 0	Pentacam, Epithelium Removal via Amalols or Alcohol, PRK, BCL Placement, Tars (H)	Pentacam, Epithelium Removal via Laser, PRK, BCL Placement, Tars (H)	Pentacam, Epithelium Removal via Laser, PRK, BCL Placement, Tars (I-K)	Pentacam, Epithelium Removal via Laser, PRK, BCL Placement, Tars (K)
Post-PRK Week 1, 2, 3	SL Photo, Tars/BCL Removal, SL Photo, Pentacam, BCL Placement, Tars (H)	SL Photo, Tars/BCL Removal, SL Photo, Pentacam, BCL Placement, Tars (H)	SL Photo, Tars/BCL Removal, SL Photo, Pentacam, BCL Placement, Tars (K)	SL Photo, Tars/BCL Removal, SL Photo, Pentacam, BCL Placement, Tars (L)
Post-PRK Week 4	SL Photo, Tars/BCL Removal, SL Photo, Pentacam, ASOCT, Sacrifice, Enucleation	SL Photo, Tars/BCL Removal, SL Photo, Pentacam, ASOCT, Sacrifice, Enucleation	SL Photo, Tars/BCL Removal, SL Photo, Pentacam, ASOCT, Sacrifice, Enucleation	SL Photo, Tars/BCL Removal, SL Photo, Pentacam, ASOCT, Sacrifice, Enucleation



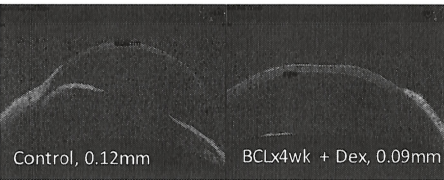
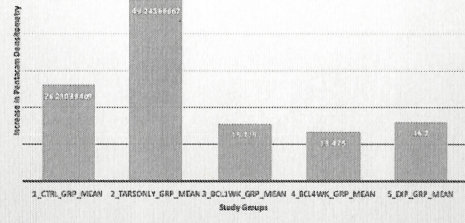
Tarsorrhaphy (tars) techniques (A) No tars with intact midlateral membrane (NM), (B) 3mm permanent lateral tars with intact NM, (C) 6mm permanent lateral tars with intact NM, (D) No tars with intact membrane removal (NMR), (E) 3mm permanent lateral tars with NMR, (F) 6mm permanent lateral tars with NMR, (G) Bolometer temporary tars, (H) Figure 8 temporary tars with intact NM, (I) Single simple interrupted suture temporary tars, (J) Figure 8 temporary tars with intact NM, (K) Two evenly spaced simple interrupted sutures temporary tars, (L) Two centrally placed simple interrupted sutures temporary tars.

# Post-Photorefractive Keratectomy Scar Prevention

Timothy A. Soeken, Michael Merkley, Wesley Brundridge, Gary Legault, Matthew Caldwell, Richard Townley  
 San Antonio Uniformed Services Health Education Consortium, San Antonio, TX

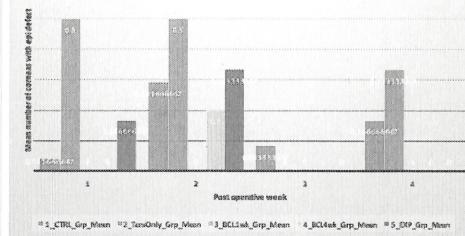
## Results

**Pentacam Densitometry Change from PreOp to POW4 of Anterior 1/3 of Central 6mm of Corneas by Study Group**



Above left, anterior segment OCT of the same control eye at POW#4 with 0.12mm of haze. Above right, anterior segment OCT of the same study eye at POW#4 with 0.09mm of haze.

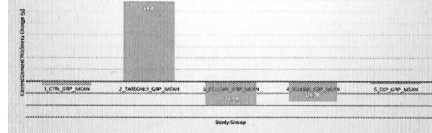
**Epithelial Defects as Detected via Slit Lamp Photography**



Above: Bar graph of mean number of corneas in each group with epithelial defects each week. The tars only group repeatedly had more epithelial defects.

Right: Bar graph of various tarsorrhaphy techniques and their respective success and failure counts. Success and failure is based on contact lens retention. Seven of the techniques did not retain any contact lenses.

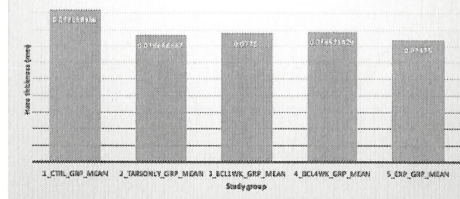
**Mean Change in Pentacam Central Corneal Thickness (µ) from POW1 to POW4 by Study Group**



Left: Bar graph of increase in densitometry as measured by the Pentacam from PreOp to POW4. The experimental contact lens is comparable to the use of a BCL and dexamethasone drops. Both the control and tars only groups displayed a much greater increase in densitometry.

Above: Bar graph of the change in central corneal thickness from POW1 to POW4. All groups except the tars only group experienced a decrease in CCT. The experimental group did not display as much of a decrease as the BCL groups.

**OCT Central Haze Thickness (mm) by Study Group at POW4**

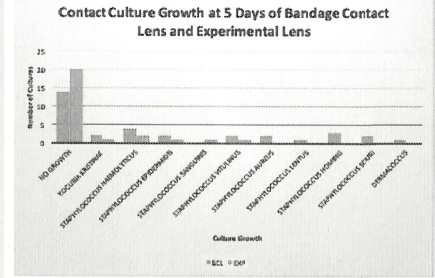
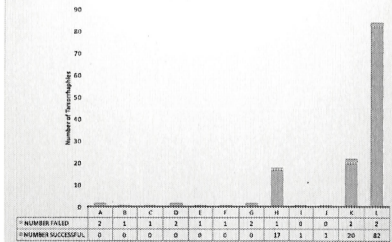


Above: Bar graph of mean central cornea haze as measured by OCT at POW4. All study groups had a mean central cornea haze less than the control group.



Top left, photograph of a control eye at POW#4. Top right, slit lamp photograph of a study eye that received a new BCL every week for 4 weeks and dexamethasone drops. More haze is visible in the control cornea.

**Tarsorrhaphy Style Success and Failure Rates**



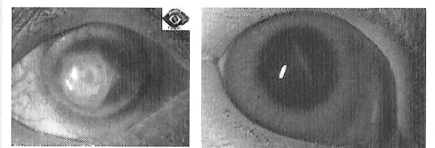
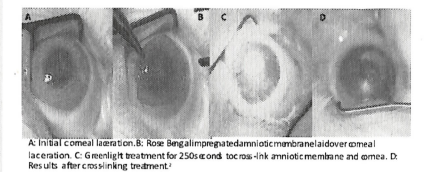
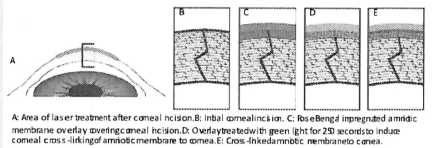
Above: Contact lens Culture Growth. The majority of all contacts produced no growth. Right: Photograph of positive culture plates grown from thioglycollate broth. All contact lenses were placed into thioglycollate broth immediately upon removal from the rabbit eye at time of weekly temporary tars removal for slit lamp photos, Pentacam scan, lens placement, and replacement of temporary tars.

## Conclusions

- The experimental dexamethasone contact lens is safe in terms of lack of epi defects, lack of culture growth, and comparable densitometry via Pentacam and comparable central haze via OCT
- For unknown reasons, and of unknown clinical significance, the central corneal thickness via Pentacam was reduced less with the experimental contacts versus the bandage contacts.
- The most successful surgical techniques involved:
  - Performing laser assisted epithelium removal,
  - Leaving the non-irritating membrane intact,
  - Placing 2 central temporary tarsorrhaphy sutures without bolsters that could be taken down and completely replaced every week
  - Slit lamp photography was found to be too difficult to obtain standardized photographs sufficient for objective haze grading
  - Pentacam densitometry has proven to be a reliable objective measure of change in our post-PRK rabbit model

## Related Study

Sealing Cornea Lacerations Without Sutures, Resulting in Minimal Corneal Scarring



Disclaimers: The views expressed are those of the author(s) and do not reflect the official views or policies of the Department of Defense or its Component. The experiments reported here in were conducted according to the principles set forth in the National Institute of Health Publication No. 8023, Guide for the Care and Use of Laboratory Animals and the Animal Welfare Act of 1966 as amended.