



Corneal Complications Associated with Scleral Lens Wear



Muriel Schornack OD¹, Cherie Nau OD¹, Amy Nau OD², Jennifer Harthan OD³,
Ellen Shorter OD⁴, Jennifer Swingle Fogt OD MS⁵

schornack.muriel@mayo.edu

¹Mayo Clinic, Rochester MN; ²Korb & Associates, Boston MA; ³Illinois College of Optometry, Chicago IL; ⁴University of Illinois, Chicago IL; ⁵The Ohio State University, Columbus OH

Purpose

- To identify corneal complications associated with scleral lens wear
- To estimate the approximate percentage of scleral lens wearers who may experience complications annually

Introduction

- Individual case reports of complications of scleral lens wear have been published. (1, 2)
- Complications have also been reported in several retrospective reviews of outcomes of scleral lens wear. (3, 4)
- A survey of scleral lens prescription and management practices conducted in 2015 collected some cursory data on complications that had been observed during scleral lens wear in a sample of 84,375 patients. (5)
 - Corneal complications were reported in only 1.2% of patients.
 - Practitioners estimated that only 70 patients (0.08%) in this sample had ever experienced microbial keratitis.

Methods

Study Design:

- Cross-sectional online survey of scleral lens providers
 - Study design was reviewed and approved by The Ohio State University IRB
- Data was collected using REDCap (housed at The Ohio State University)
- Survey was available from November 8, 2019-March 31, 2020

Data Collected:

- Estimated number of scleral lens patients evaluated during the past year
- Number of patients who had been newly diagnosed with microbial keratitis, corneal neovascularization, corneal edema, or limbal stem cell deficiency during the past year
- Additional pathology related to disease progression and/or scleral lens wear

Statistical Analysis:

- Descriptive statistics are reported.

Results

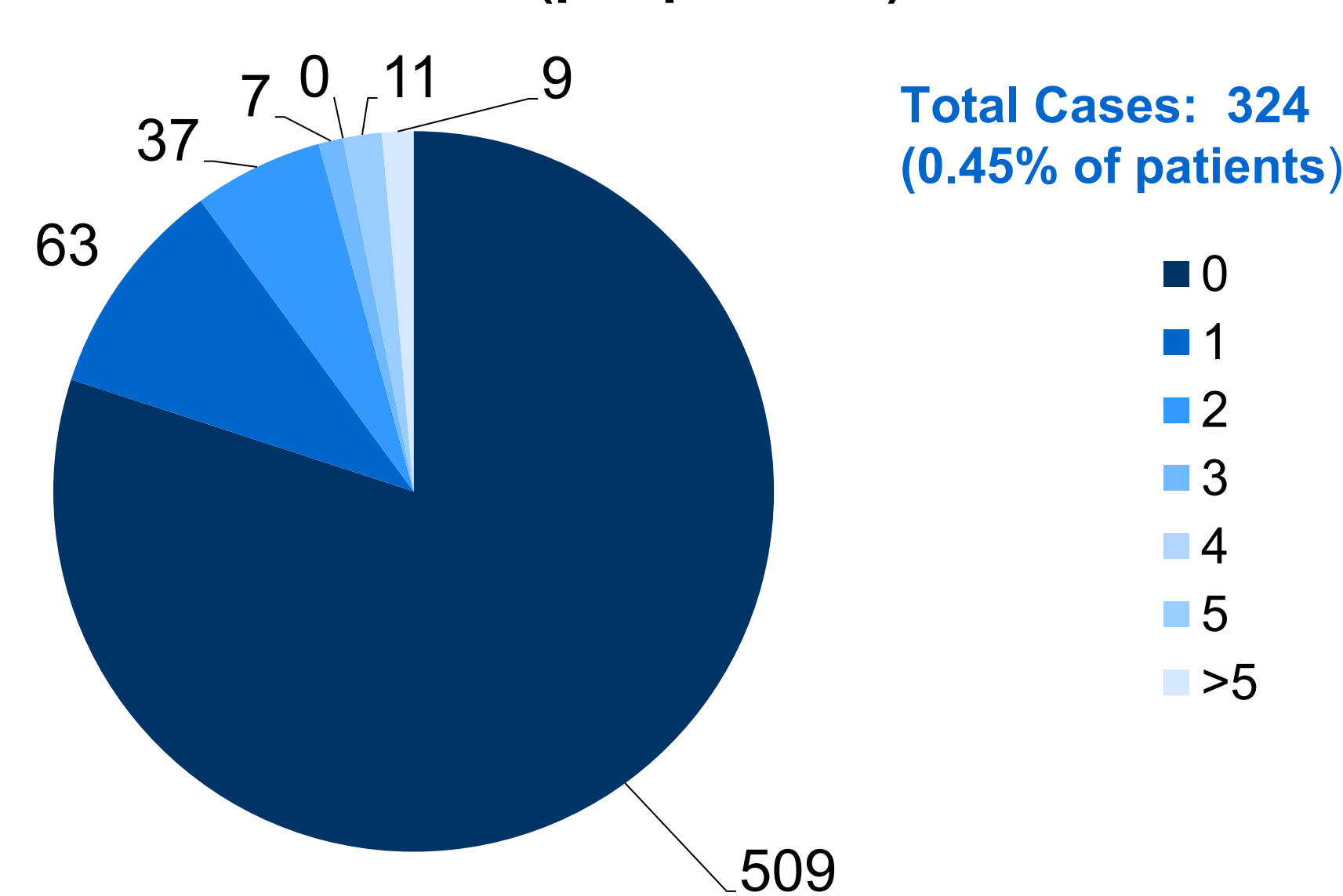
Number of survey participants:
643

Total number of patients fit with scleral lens:
213,445

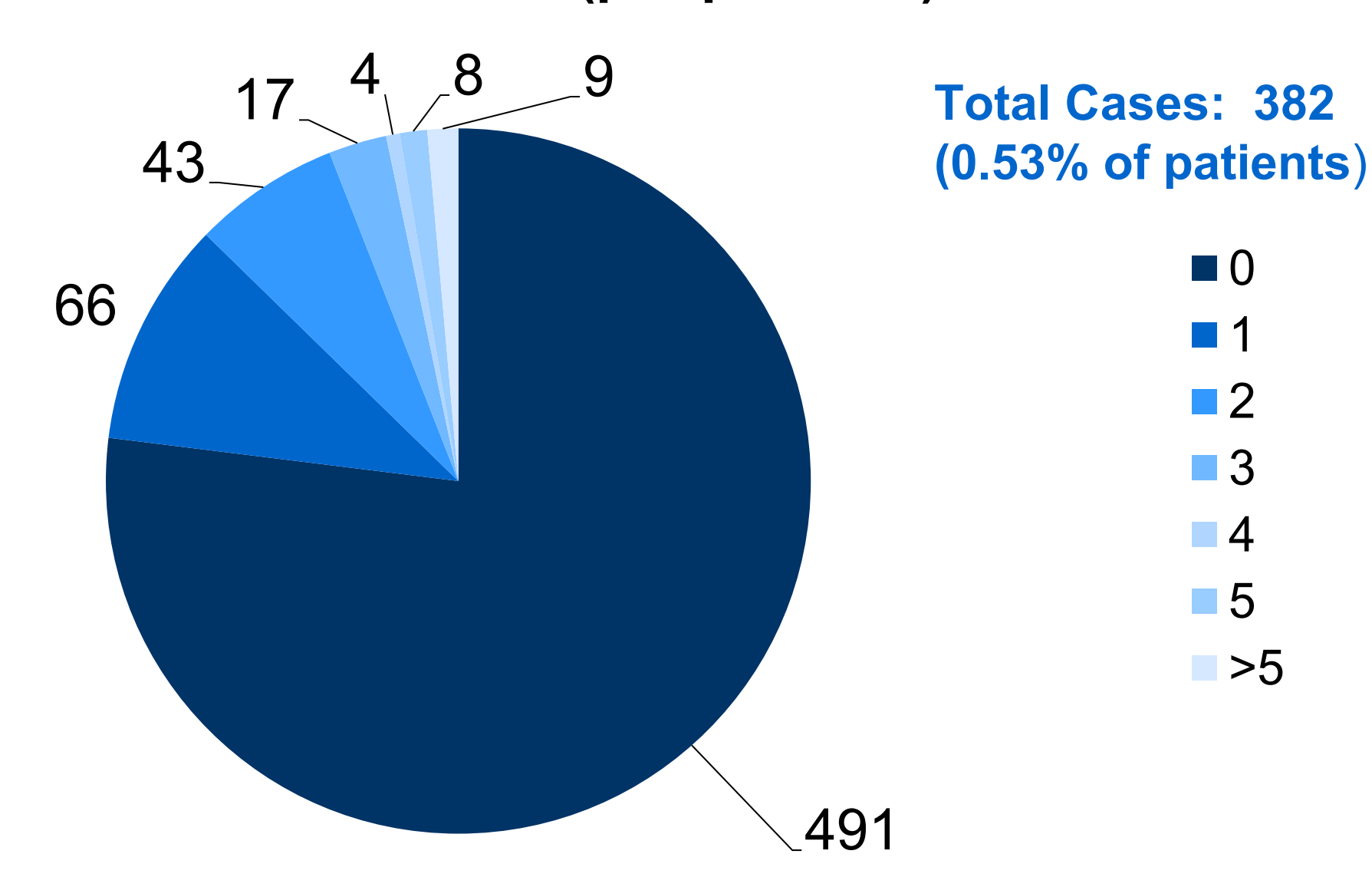
Number of scleral lens patients evaluated within the past year: 72,605

Corneal Complications

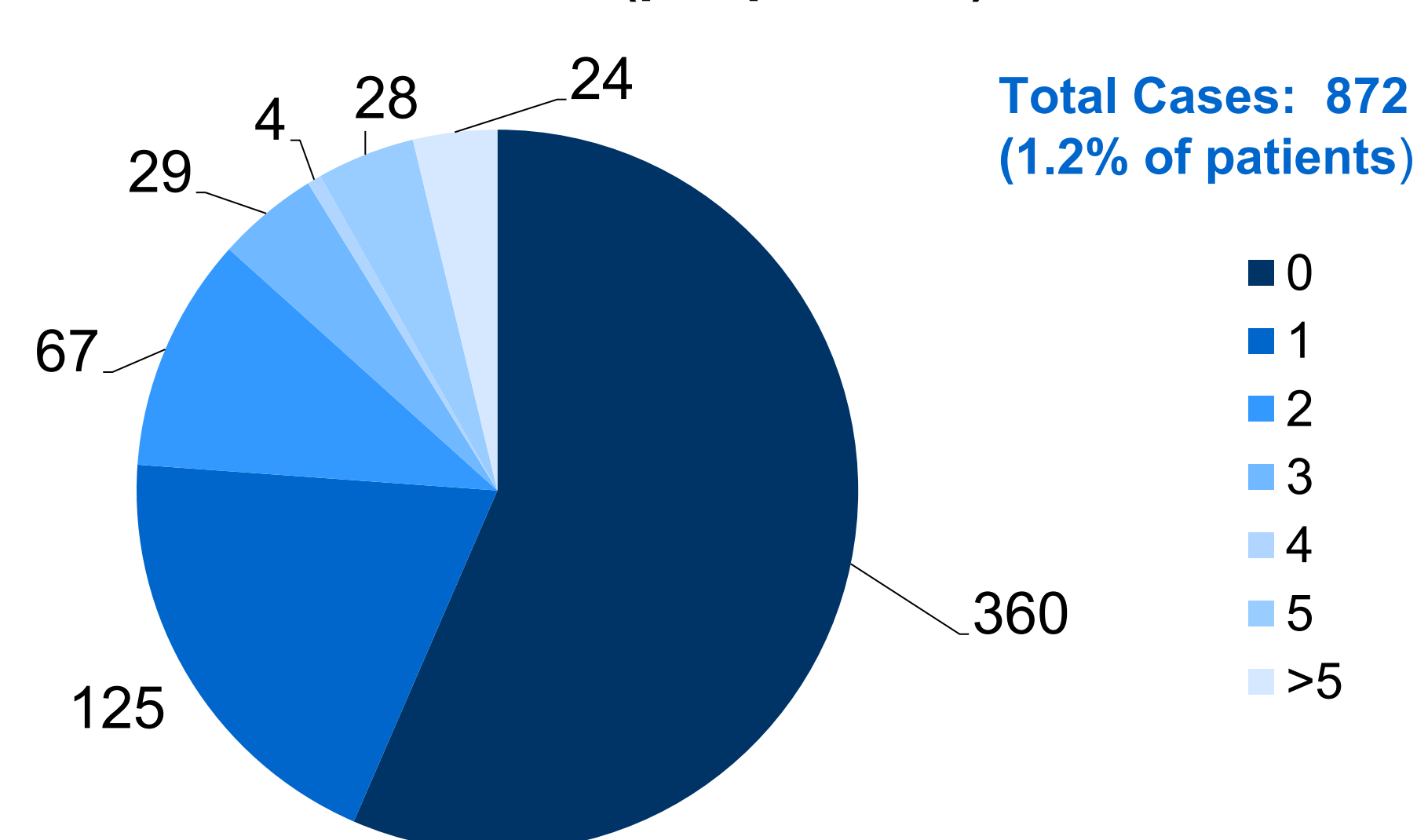
Number of Cases of Microbial Keratitis (per practice)



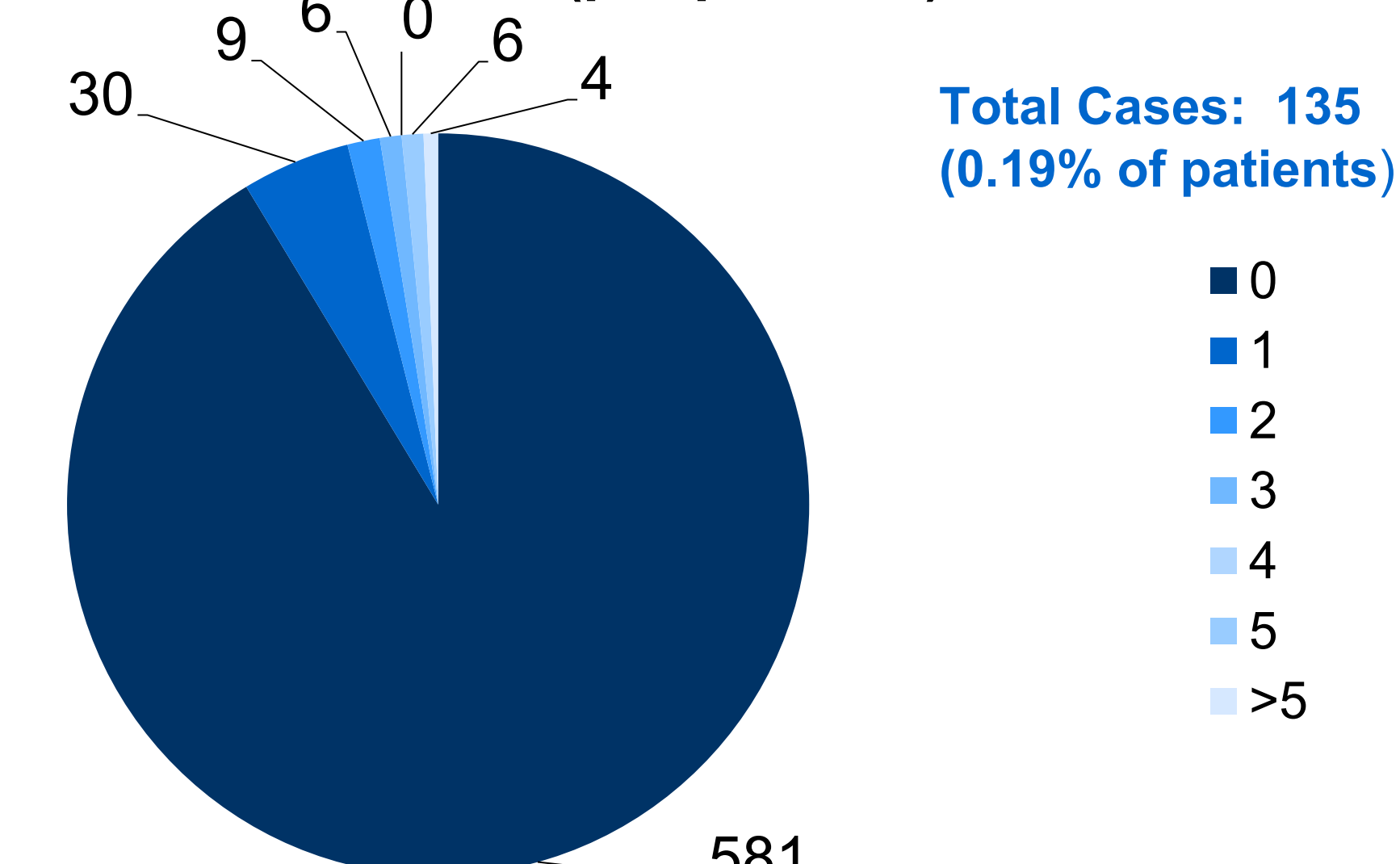
Number of Cases of Corneal Neovascularization (per practice)



Number of Cases of Corneal Edema (per practice)



Number of Cases of Limbal Stem Cell Deficiency (per practice)



Summary:

- Assuming that no patients experienced more than one complication, a total of 584 patients experience a corneal complication associated with scleral lens wear
- This represents 0.8% of the 72,605 patients represented in this sample

Additional findings:

- Disease progression necessitated surgical intervention in 17 patients
- Graft complications were reported in 12 patients
- Hydrops was diagnosed in 7 patients
- Elevated intraocular pressure was noted in 4 patients

Conclusions

- This data suggests that the risk of sight-threatening complications associated with scleral lens wear is low.
- In this study, 0.45% of patients were reported to have experienced microbial keratitis, compared to just 0.08% of patients in a previous study.
- Further study is needed to more accurately assess the incidence of complications and adverse effects associated with scleral lens wear.

References

- Zimmerman AB, Marks A. Microbial keratitis secondary to unintended poor compliance with scleral gas-permeable contact lenses. *Eye & Contact Lens: Science & Clinical Practice*. 2014;40(1):e1-4.
- Fernandes M, Sharma S. Polymicrobial and microsporidial keratitis in a patient using Boston scleral contact lens for Sjogren's syndrome and ocular cicatricial pemphigoid. *Contact lens & anterior eye : the journal of the British Contact Lens Association*. 2013;36(2):95-7.
- Kalwerisky K, Davies B, Mihora L, Czyz CN, Foster JA, DeMartelaere S. Use of the Boston Ocular Surface Prosthesis in the management of severe periorbital thermal injuries: a case series of 10 patients. *Ophthalmology*. 2012;119(3):516-21.
- Schornack MM, Pyle J, Patel SV. Scleral Lenses in the Management of Ocular Surface Disease. *Ophthalmology*. 2014;121(7):1398-405.
- Schornack M. Adverse Events Associated with Scleral Lens Wear: Proceedings of the International Forum on Scleral Lens Research. *Journal of Contact Lens Research and Science*. 2018;2:13-7.

Support



Center for Clinical and Translational Science Grant: UL1TR002377



THE OHIO STATE UNIVERSITY

Center for Clinical and Translational Science Grant: UL1TR002733

Disclosure

None (A. Nau, C. Nau, M. Schornack, E. Shorter)
J. Fogt: Alcon, Contamac, EyeLab, EyeNovia, Innovega, Nevakar, Ocugen
J. Harthan: Allergan, Bausch & Lomb, Contamac, Essilor, Euclid, International Keratoconus Academy, Kala Pharmaceuticals, Metro Optics, SynergEyes, Tangible ScienceA. Nau: Avedro, Johnson & Johnson