Table 1. Intraocular Pressure Elevation Resulting from Eye Rubbing

	Nonhuman Primate Identifier					
	9028	9160		0804025		Overall
Eye	Left	Right	Left	Right	Left	Both
No. of eye rubs	20	27	39	45	32	163
IOP (mmHg)						
Mean	81	105	98	110	152	109
Standard deviation	76	77	64	50	97	26
Maximum	252	266	265	206	310	310
Minimum	3	12	20	29	10	3

IOP = intraocular pressure.
Intraocular pressure increased significantly by 109±26 mmHg more than baseline values because of eye rubbing (163 eye rubs studied) in 5 eyes of 3 nonhuman primates ($P < 0.0005$). Ninety-eight percent of eye rubs (159 of 162 eyes rubs) were more than 10 mmHg.

humans due to differences in hand, ocular, and orbital anatomic features. Nonhuman primates have smaller eyes, smaller hands, and a more prominent brow ridge, although IOPs and forces in NHPs should be relatively similar to that in humans.

In conclusion, eye rubbing can cause acute IOP elevations up to 310 mmHg above baseline. The IOP elevation associated with eye rubbing was related directly to both the intensity of the rubbing and which part of the hand or wrist contacted the eye. Eye rubbing could, in theory, induce IOP-mediated mechanical damage to ocular structures that are relevant in diseases such as keratoconus and glaucoma.

Daniel C. Turner, BS[1]
Christopher A. Girkin, MD, MSPH[2]
J. Crawford Downs, PhD[2]

[1]*Department of Vision Sciences, School of Optometry, University of Alabama at Birmingham, Birmingham, Alabama;* [2]*Department of Ophthalmology and Visual Sciences, School of Medicine, University of Alabama at Birmingham, Birmingham, Alabama*

Presented at: American Glaucoma Society Annual Meeting, March 2016, San Diego, California.

Financial Disclosure(s): The author(s) have no proprietary or commercial interest in any materials discussed in this article.
Supported by the National Institutes of Health, Bethesda, Maryland (grant nos.: R01-EY024732 [J.C.D.], R01-EY026035 [J.C.D.], P30-EY003039 [UAB Core Facilities grant]; EyeSight Foundation of Alabama, Birmingham, Alabama; Research to Prevent Blindness, Inc., New York, New York. The funding organizations had no role in the design or conduct of this research.

HUMAN SUBJECTS: No human subjects were included in this study. Nonhuman animals were used in a study. Protocol was approved by Institutional Animal Care and Use Committee of the University of Alabama at Birmingham, Birmingham, Alabama.

Animal subjects were used in this study.

Author Contributions:
Conception and design: Turner, Girkin, Downs
Analysis and interpretation: Turner, Downs
Data collection: Turner, Girkin, Downs
Obtained funding: Girkin, Downs
Overall responsibility: Turner, Girkin, Downs

Correspondence:
J. Crawford Downs, PhD, Department of Ophthalmology and Visual Sciences, University of Alabama at Birmingham School of Medicine, 1670 University Boulevard, VH 390A, Birmingham, AL 35294. E-mail: cdowns@uab.edu.

References

1. Pecora L, Sibony P, Fourman S. Eye-rubbing optic neuropathy. *Am J Ophthalmol*. 2002;134(3):460–461.
2. Osuagwu UL, Alanazi SA. Eye rubbing-induced changes in intraocular pressure and corneal thickness measured at five locations, in subjects with ocular allergy. *Int J Ophthalmol*. 2015;8(1):81–88.
3. Resta V, Novelli E, Vozzi G, et al. Acute retinal ganglion cell injury caused by intraocular pressure spikes is mediated by endogenous extracellular ATP. *Eur J Neurosci*. 2007;25(9):2741–2754.
4. Suki B, Parameswaran H, Imsirovic J, Bartolak-Suki E. Regulatory roles of fluctuation-driven mechanotransduction in cell function. *Physiology (Bethesda)*. 2016;31(5):346–358.
5. Downs JC, Burgoyne CF, Seigfreid WP, et al. 24-hour IOP telemetry in the nonhuman primate: implant system performance and initial characterization of IOP at multiple timescales. *Invest Ophthalmol Vis Sci*. 2011;52(10):7365–7375.

Sexual Harassment in Ophthalmology: A Survey Study

The #MeToo movement has raised awareness of sexual harassment in the workplace. The recent dismissal of the University of Southern California's medical dean highlights its impact on the highest levels of ophthalmology leadership. Sexual harassment interferes with education, job satisfaction, and mental health and can constrain opportunities for professional advancement, with data in the medical community going back decades.[1,2] The aim of the current study was to understand better the scope and prevalence of sexual harassment among ophthalmologists.

The authors developed a survey based on a PubMed review from 1990 to 2017 (key words: *sexual harassment* and *medicine*) with University of Washington Institutional Review Board approval and adhering to the tenets of the Declaration of Helsinki. Ophthalmologists and ophthalmologists in training in the United States or Canada were invited to participate in this anonymous online WebQ (Catalyst, Seattle, WA) survey (Fig S1, available at www.aaojournal.org) in March 2018 through the Women in Ophthalmology listserv (including mostly female ophthalmologists and supporters). Participants entered a raffle for a $150 gift card.

Among 1671 e-mails sent, 698 were opened, of which 447 (27%, based on American Association for Public Opinion Research calculation) eligible participants responded (Table S1, available at www.aaojournal.org). In total, 265 of 447 respondents (59%) reported having experienced sexual harassment (see previously validated definitions[1] in Fig 1) during their ophthalmology career, and 47% noted at least 1 episode within the previous 5 years. Respondents reported a median of 10 sexual harassment experiences (interquartile range, 4–20) perpetrated by a median of 3 harassers (interquartile range, 2–7; Table 2). Excluding respondents harassed

Table 2. Characteristics of Sexual Harassers According to Victims Responding to this Survey

	N (%)*
Approximate age	
21-30 years old	73 (28)
31-40 years old	93 (35)
41-50 years old	130 (49)
51-60 years old	137 (52)
61-70 years old	93 (35)
>70 years old	32 (12)
Role	
Medical Student	28 (11)
Resident	78 (29)
Fellow	37 (14)
Academic attending	225 (84)
Private Practice Ophthalmologist	49 (18)
Patient	118 (45)
Patient's family member	41 (15)
Ophthalmic technician	15 (6)
Hospital or practice administrator	9 (3)
Other	30 (11)
Region where harasser resided	
United States West	61 (23)
United States Midwest	94 (35)
United States South	70 (26)
United States Northeast	124 (47)
Canada	10 (4)
I don't know	3 (1)

*Percentage represents proportion of victims (N = 265) who selected that answer. Respondents could choose more than 1 answer to account for multiple harassers and harassment episodes, therefore sum of values exceeds 265 and sum of percentages exceeds 100.

solely by patients, sexual harassment prevalence was 36%, consistent with that of the broader medical community.[1,2]

Among victims, 87% reported significant impacts on their professional lives. Almost one quarter reported that their harassment experiences interfered with their ability to work, and 15% changed jobs or even careers as a result of their most significant harassment experience. Such impacts may contribute to known lower earnings, fewer industry ties, and fewer editorial positions among female ophthalmologists.[3] We were disturbed to learn of 3 cases of attempted rape and 1 rape. Despite high severity, few victims (15%) reported their most significant experience to an authority.

Most sexual harassment cases involved trainees. Two descriptions were particularly shocking:

1. "During my second year of my ophthalmology residency while rotating though the Program Director's subspecialty, the Program Director pinned me to the wall and told me to come to his house that weekend, while his wife was out of town. I did not go to his house. Subsequently, he completed a very negative evaluation of my performance on his rotation, much lower than any prior evaluation I had received to that date. I reported the sexual harassment to the Chairman of Ophthalmology, but so far as I know, nothing was done."
2. "I was told by my department chair more than once that unless I was willing to engage in sexual activity with him he would fire me from my residency program."

Several respondents described sexual harassment by department chairmen or residency program directors. Departments should consider a "professionalism mentor" role outside of department leadership to encourage reporting, especially when a supervisor is the perpetrator.

Private practice ophthalmologists (20%) and academic attending ophthalmologists (22%) were also victims, as demonstrated by the following example:

> "The last was on a social evening at a meeting and a very well known and published ophthalmologist started grabbing my breasts as soon as the light was turned off on the bus. I could not move to another seat because the bus was full and was too embarrassed to yell. I felt like I was dealing with an octopus, and was so stunned since I had admired his work. I was in my late 30s and he was in his late 60s at least."

Among all participants, 42% observed sexual harassment as a bystander (Table S1). Of these, 33% took no action. Bystanders who had personally experienced sexual harassment were more likely to intervene ($P < 0.001$). Bystander intervention is one of the only proven effective methods of sexual harassment prevention,[4] and bystander education may increase bystander intervention. The following experience demonstrates that even bystanders with less power can effectively intervene:

> "Last year I had a male colleague describe a surgical case and in front of several men say, 'I kept pushing deep into the nucleus just like you would want it' referring to me as the person that would want it. A medical student spoke up and said, "I don't think that is OK.""

This survey's study limitations include low male and non-white representation. Although men may be victims of sexual harassment, the rate is known to be low (4%).[2] The known intersection between race and gender in sexual harassment could not be investigated adequately. This study also does not address other forms of gender discrimination, which certainly deserve attention, but were beyond the scope of this survey. Finally, those who have endured sexual harassment experiences may be more likely to join Women in Ophthalmology, to have an interest in this survey, or both. Nonetheless, many of the described experiences should spark outrage, even if we believed that they were infrequent.

We commend the American Academy of Ophthalmology's CEO David Parke II, MD, for endorsing a zero tolerance sexual harassment policy,[5] now in place for Academy events. A more broad Academy sexual harassment policy would be a critical next step. Nonetheless, much more is needed on the local level, including creating robust structures for managing complaints, punishing and rehabilitating offenders, and supporting victims. Mandatory departmental sexual harassment policy enforcement for residency accreditation should be considered.

Although opportunities to address this problem persist on a policy level, knowing that sexual harassment is prevalent in ophthalmology also gives victims and bystanders the courage to speak up on an individual level. How we choose to address the problem of sexual harassment now will shape the future of our profession. If we care about the successful education of our trainees, mentorship, science, and patient care, we must take action.

Michelle T. Cabrera, MD[1,2]
Laura B. Enyedi, MD[3,4]
Leona Ding, MS[1]
Susan M. MacDonald, MD[5]

[1]*Department of Ophthalmology, University of Washington, Seattle, Washington;* [2]*Department of Ophthalmology, Seattle Children's Hospital, Seattle, Washington;* [3]*Department of Ophthalmology, Duke University, Durham, North Carolina;* [4]*Department of Pediatrics, Duke University, Durham, North Carolina;* [5]*Department of Ophthalmology, Tufts University, Boston, Massachusetts*

Presented at: American Academy of Ophthalmology Annual Meeting Chicago, IL, October 2018.

Financial Disclosure(s): The author(s) have no proprietary or commercial interest in any materials discussed in this article.
Supported by Research to Prevent Blindness, Inc., New York, New York; and the National Institutes of Health, Bethesda, Maryland (grant no.: EY001730). The funding organizations had no role in the design or conduct of this research.

HUMAN SUBJECTS: Human subjects were included in this study. The human ethics committees at the University of Washington approved the study. All research adhered to the tenets of the Declaration of Helsinki. All participants provided informed consent.

No animal subjects were included in this study.

Author Contributions:
Conception and design: Cabrera, Enyedi, Ding, MacDonald
Analysis and interpretation: Cabrera, Enyedi, Ding, MacDonald
Data collection: Cabrera, Enyedi, MacDonald
Obtained funding: N/A
Overall responsibility: Cabrera, Enyedi, Ding, MacDonald

Correspondence:
Michelle T. Cabrera, MD, 4800 Sand Point Way NE, Seattle, WA 98105. E-mail: cabreram@uw.edu.

References

1. Komaromy M, Bindman AB, Haber RJ, Sande MA. Sexual harassment in medical training. *N Engl J Med*. 1993;328(5):322–326.
2. Jagsi R, Griffith KA, Jones R, et al. Sexual harassment and discrimination experiences of academic medical faculty. *JAMA*. 2016;315(19):2120–2121.
3. Reddy AK, Bounds GW, Bakri SJ, et al. Differences in clinical activity and Medicare payments for female vs male ophthalmologists. *JAMA Ophthalmol*. 2017;135(3):205–213.
4. Potter SJ, Stapleton JG. Translating sexual assault prevention from a college campus to a United States military installation: piloting the know-your-power bystander social marketing campaign. *J Interpers Violence*. 2012;27(8):1593–1621.
5. Parke DW. Sexual harassment and ophthalmology. *EyeNet Magazine*. 2018;22(1):12.