"Well-Behaved Women Seldom Make History": The Advancement of Women in Ophthalmology

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Thank you all so much. It is truly an honor to be here today with all of you accepting the R. Townley Paton Award. It is particularly special in light of the fact that it has been nearly two years since we have all been together due to the COVID pandemic, and I know that it hasn't been an easy two years for any of us. So, thank you to all of you for being here today, and of course, thank you to the Paton Award Committee for selecting me for this honor.

As I was preparing for this talk, I thought a lot about what it means to be part of Dr. Paton's legacy. R. Townley Paton was the father of modern eye banking. He founded the first eye bank in New York City on December 15, 1944. The amount of courage, conviction and, truthfully, confidence that it must have taken to overcome the social, legal, and logistical barriers to do this is more than I can imagine. We, as a profession, are very much indebted to him and his vision to create a system that would allow for obtaining, preserving and distributing ocular tissue so that others could regain sight. It is truly an honor to be receiving this award today and to be included among the list of prior Paton Award Recipients. I am humbled to be included in this group. I look at this list and I see the names of the greats in our field. I see the names of my teachers and my mentors, and I see the names of so many people that I respect and admire. And then I see my name and I think, "What am I doing up there?!"

But, you know the other thing I see when I look at this list? I see the fact that despite how far we have come as a profession over the past four decades and the huge strides we have made in corneal transplantation and eye banking, we cannot say the same about our efforts in closing gender gaps and improving diversity. We have, of course, made progress compared to 40 years ago, but we still have a long way to go.

A recent study published in the American Journal of Ophthalmology by Nguyen et al,[1] found that between 1970 and 2020, 25% of all awards by ophthalmology societies were given to women. Notably, this is a huge improvement over time from 0% in 1970 to now 33% in 2020. We have made positive inroads particularly in trainee awards and early career awards, but women continue to be underrepresented for achievement awards, society awards, and named lectures. So, it really is an honor to be on this list as only the second woman after Dr. Marian Macsai to receive this award and the first woman in 18 years. And this year, at the AAO, I am honored to be standing shoulder to shoulder with other even more accomplished women – with Dr. Jayne Weiss giving the Castroviejo Lecture, Dr. Debbie Jacobs giving the Whitney G. Sampson lecture, and Dr. Maria Henriquez who will be receiving this year's Troutman Award.

I stand here today because of the determination and the conviction of women who pushed open the doors for the rest of us to walk through. I stand on their shoulders—the shoulders of giants. In our time together today, I want to acknowledge a few of the women who fought and persisted in paving the way for the rest of us in medicine and in ophthalmology. I want us to look together at how far we really have come, but also to acknowledge the work that is yet to be done.

The first woman to receive a medical degree in the United States was Elizabeth Blackwell. Women had always been involved in caring for people, but had been relegated to alternate paths of healing. Elizabeth Blackwell was not only determined to be a physician and to graduate from medical school, but to graduate with the same credentials as men. She knew she was a trailblazer and she did not want set a precedence for women receiving low-quality training. And so she applied to medical schools – only to be rejected by all 29. One dean wrote to her stating, "You cannot expect us to furnish you with a stick to break our heads with."[2] Some suggested that she should disguise herself as a man and earn her degree. But, she wanted to prove that women were capable, just like men. And so finally, after refusing to cave to societal pressures and the many letters of rejection, in October 1847, she received a letter of admittance

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to Geneva Medical College in New York. What she didn't know at the time was that her admittance was a fluke. The professors had decided to not make the decision themselves and to allow the male students to vote on whether or not they would have a woman in their class, and the men, thinking it was a practical joke, voted unanimously to admit a woman only to be shocked into silence when she actually arrived into their classroom. She faced discrimination and obstacles all along the way: from the local towns people unwilling to rent her a room, to her classmates throwing things at her during class, to having to demand to be allowed into certain lessons in the anatomy lab. But in the end, she graduated at the top of her class in 1849, vowing that "It shall be the effort of my life, by God's blessing, to shed honor on this diploma".[2] And honor it she did.

Elizabeth Blackwell went on to continue her studies in Paris where she had hoped to study surgery. Unfortunately, while working to clean the eyes of a newborn with gonococcal ophthalmia neonatorum, she was inadvertently splashed with some of the infected fluid and developed gonococcal keratoconjunctivitis herself.[3] This ultimately left her blind in the left eye and unable to pursue the career in surgery as she had planned. Instead, she went on to co-found the New York Infirmary for Indigent Women and Children in 1857 which eventually became part of what is now New York Presbyterian Lower Manhattan Hospital. She also established the Woman's Medical College of the New York Infirmary in 1867, and by the time the Woman's Medical College closed its doors 30 years later, they had graduated 364 women with medical degrees.[2]

Among those women who benefited directly from the work of Elizabeth Blackwell was Isabel Hayes Chapin Burrows. Burrows graduated from Blackwell's Women's Medical College in 1869 and went on to the University of Vienna Medical School to become one of the first two women medical students in Vienna.[4] There she discovered her passion for ophthalmology and was encouraged to pursue ophthalmology by Dr. Eduard Jaeger who saw no reason why she should not be the first woman ophthalmologist in America and even instructed her in performing her first couching procedure.[4]

Isabel Burrows returned to America and with $100 worth of instruments, she opened her practice in Washington DC in 1871.[4] She was the first woman to have a private medical practice in DC and the first woman professor at Howard University where she assisted in surgery, rounded in the wards, and gave lectures to medical students.[4]

There have been other countless women who followed in the footsteps of these two pioneers and who continued to break down the barriers for women in medicine and ophthalmology. We don't have the time to go into all of their stories, but women like Elizabeth Sargent, Amy Barton, Maud Carvill who all helped to further the progress of women in ophthalmology.[5,6]

Sadly, despite a surge of women entering medicine at the end of the 19th century, the beginning of the 20th century saw a decline. 100 years after Elizabeth Blackwell received her degree from Geneva Medical College, only 5% of students entering medical school were women.[7] That number increased very slowly to just over 10% in 1970. It was not until the passage of the Title IX in 1972 that prohibited sex-based discrimination in schools or educational programs that received federal funding, that the number of women pursing medicine finally started to increase significantly – by 1974, 22% of new medical school students were women.[7] It would take two more decades for women to break the 40% mark of medical school matriculants, and another two decades after that to finally break the 50% mark.[8]

In 2017, the number of women entering medical school finally outnumbered the number of men, and this trend continued for the 2018 and 2019 entering medical school classes.[8] As a result, for the first time, in 2019, women made up the majority of students in US medical schools. However, the number of women graduating from medical schools has yet to reach 50% even as of the most recent data in 2020.[9,10] But, we are so close. In 2020, 49.6% of the students graduating medical school were women.[9] With increasing numbers of women entering medical school, we now make up about 35% of the US physician workforce, compared to just 5% in 1970.[10]

If those numbers reflect all women entering medicine, what do things look like within ophthalmology in particular? In ophthalmology, women have yet to close the gap. Despite the near gender parity of medical school students in the United States, there has not been a substantial change noted in the percentage of female applicants or females who match into ophthalmology. It has remained essentially steady hovering around 40%.[11]

Aguwa et al. recently found that between 2011 and 2019, the percentage of female ophthalmology residents actually decreased by 2.5% from 41.5% to 39%.[11] This decrease in the percentage of female ophthalmology residents is in contrast to a 0.6% increase in female residents overall, and a 2.3% increase in female residents in surgical specialties.[11] It appears that we continue to have a recruitment issue when it comes to encouraging women to pursue ophthalmology.

How does that translate into women in the workforce? In a paper that was recently published by Gill et al., the authors

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looked at data from the AMA from 1969 until present.[12] We can see the progress women have made in medicine over 50 years. However, the percentage of women in ophthalmology continues to be significantly lower than the percentage of overall working women physicians.[12] The question is then, how do we overcome this gap in representation within our field?

We need to start by addressing some of the gender gaps issues that remain for women in ophthalmology at all stages of their career. It begins during residency. In a paper by Gong et al., they found that female residents between 2005 and 2017 performed between 8-22 fewer cataract surgeries and between 36-80 fewer total procedures than their male counterparts.[13] They reported that parental leave had no impact on their findings.[13]

The gender gap issues continue when we enter practice. Jia et al. found in a 2020 survey that female ophthalmologists have a mean starting salary 12.5% lower than their male colleagues.[14] Even when controlling for subspecialty training and practice type (academic versus private practice), female ophthalmologists were still out earned despite the fact that both men and women were equally likely to negotiate their contracts.[14] Why the discrepancy? You cannot attribute this difference to either productivity or work experience since this data is looking at the first contracts out of training. Pay disparity exists for whatever reasons, but even these small gaps in starting salary inequalities can lead to significant discrepancies in lifetime earning potential.

Unfortunately, gender gap differences persist throughout a woman's career. Feng et al. evaluated Medicare data from 2017 and found that male ophthalmologists performed more cataract surgeries than female ophthalmologists even when accounting for differences in clinical volume and experience.[15] The bright spot here is that the data shows greater parity among more recently graduated ophthalmologists. Hopefully, these numbers will equalize more and more over time.

But, for now, women perform fewer surgeries, see fewer numbers of patients, and collect less than their male counterparts.[13-15] We have already discussed the differences in salaries between men and women ophthalmologists in their first year of practice.[14] In a study by Ahmad et al., the authors looked at earnings of ophthalmologist all stages of career.[16] They evaluated Medicare collection data between 2012 and 2015 found that in general, the median male ophthalmologist out-earns the 75th percentile female in all subspecialties except for general medical ophthalmology.[16] That difference between male and female ophthalmologists amounts to an average of $133,000 more in collection per year and more than 300 more distinct patient encounters per year. These findings were observed across age groups, practice types and geography.

Now that we have seen some of the gender differences in ophthalmology on the whole, let us look a little more specifically at women in academia. Data from the Association of American Medical Colleges shows that the number of full-time women faculty in all specialties at US medical schools has increased from 36% in 2009 to 41% in 2018.[17] Within academic ophthalmology, women currently represent about 39% of clinical faculty up from just 24% in 2003.[11,17] Female ophthalmologists coming out of training are actually more likely to take an academic position than their male counterparts – 43% of women vs. 30% of men.[14] However, when we look at leadership positions in departments of ophthalmology, the gender gap is much more pronounced with women accounting for only 28% of residency program directors and 14% of department chairs.[18,19] That being said, women making up 14% of department chairs is a significant improvement from just 2% approximately 20 years ago.[19] Women are making advances, but perhaps not as quickly as we would like or expect.

Several years ago, Dr. Sonal Tuli looked more in depth at the progress of women in academic ophthalmology.[20] She found that while more women than men had entered academia between 2003 and 2017, the number of women at the professor level increased by only 90 women compared to nearly 200 men.[20] She also found that women did not appear to be advancing in academic rank as quickly as men and that the gap in the percentage of women at the Professor rank is widening between ophthalmology and other clinical specialties. Dr. Tuli suggests that there are many factors that contribute to these gender differences in academic ophthalmology. Beyond explicit and implicit bias, women may not be as strategic with how they are positioning themselves for promotion particularly in the realm of research and scholarly activity.

But, women are making some in roads in these areas as well. For instance, a look at female presenters at ophthalmology conferences show that while women continue to be a minority of podium speakers, the proportion of women giving both paper and non-paper presentations is increasing although there continues to be gender gaps particularly for non-paper presentations which tend to be invitation-based.[21,22]

Finally, we can see that over the past 15 years or so, the number of women publishing in the Cornea journal at both first and last author positions has increased although we remain the minority.[23] Similarly, the proportion of edito-

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rials authored by women in ophthalmology journals with high impact factors has also increased, although there is a higher percentage of authors who are non-ophthalmologist amongst the women than the men.[24] But again, when we look at positions of leadership, the editor-in-chief of the top 10 ophthalmology journals by impact factor are all men.[25] Even among the editorial boards, only *JAMA Ophthalmology* has more than 50% women on its editorial board, the others range from as low as 11% to as high as 45%.[25] Truthfully, when I am presented with data like this, only one thing comes to mind: in the words of Ruth Bader Ginsberg, "Women belong in all places where decisions are being made."

Where does this leave us? Where do we go from here? I don't have the answers for you today. But, putting together this talk has prompted me to think about what my own next steps will be.

I think the first step is best summed up by this quote from Sheryl Sandberg. And I know, I'm not here to discuss what we actually think about the "Leaning In" movement and I'm certainly not here to solicit opinions about Facebook. But, this quote from her rings very true to our current discussion: "We cannot change what we are not aware of, and once we are aware, we cannot help but change." I am here today to hopefully help and encourage us all to be more aware so that we can actually make effectual change going forward.

The second step is that we need to support each other. Two of the more interesting findings from some of literature that I have already presented, was the fact that that there is a significant correlation between the gender of first and last authors in manuscripts published in *Cornea*,[23] and the fact that when a woman was included on a program committee for vitreoretinal meetings, women were also more likely to be included for non-paper podium presentations and roles.[22] Women helping women. We should be helping each other succeed and we need to be even more deliberate in mentoring our younger colleagues.

Finally, as a community, we need to support efforts for diversity, equity and inclusion. We have talked a lot about the advancement of women today, but there are a lot of other ways in which our profession needs to grow. We need to educate ourselves; we need to be willing to identify and mitigate our own conscious and unconscious biases, to address disparities within our profession, and to promote opportunities for all to achieve their full potential. As for me, I am on this journey just like the rest of you. I am far from being a trailblazer or a pioneer, but I do hope to be part of the change.

For myself, I feel extraordinary fortunate to be here today, as a woman and as a person of color. Just like many of you, I often struggle with so-called imposter syndrome – I am sure many of you know what I am talking about. That self-doubt can keep us from becoming the best versions of ourselves. But, what has helped me stay the course, is that I finally found something to be passionate about, and I hope that that can be the case for all of you. For me, at the heart of it is my desire to help my patients improve their vision and their quality of life through corneal transplantation. The corollary to that is the understanding and appreciation for the role that eye banks and donors play in making it all possible. By helping to advance corneal transplantation and eye banking, I can be a small part of the ultimate vision: restoration of sight worldwide.

Through cornea and eye banking, I found a community that supports me fully. The EBAA has always been an organization where women have played key and pivotal roles. And even though we've talked a lot today about R. Townley Paton, we need to acknowledge that without Aida Breckinridge who was by his side as he started on the eye banking endeavor, he probably would not have gotten nearly as far as he did. Aida Breckinridge was the first executive director at the Eye Bank for Sight Restoration. She obtained start up funding for the Eye Bank and enlisted the support of many influential men and women of that time.[26] She also helped educate the public about eye banking and corneal donation.[26] I found a copy of the August 1948 Reader's Digest that has a piece highlighting Aida's life.[27] It's aptly titled: "She Deals in Human Eyes" and it starts with this sentence: "Serene, gray-haired Aida de Acosta Breckinridge is unique among the world's bankers – she deals exclusively in fresh human eyes that enable blind people to see again." Women in eye banking, at the table, from the beginning.

So, thank you to my EBAA family — all of my friends and colleagues, corneal surgeons and eye bankers alike — who have supported me through the years. I do not have the time today to acknowledge each of you, but since we are talking about women supporting women, I do want to recognize just a few of the women that have played a key role in getting me involved with the EBAA. Thank you, Marian Macsai, for putting me on my first committee and for advocating for me all along the way. Thank you, Ellen Heck, who for reasons I will never understand, has always been my staunchest supporter. Thank you, Donna Drury, for putting me on the EBAA Board my first time. And of course, thank you, Stacey Gardner, for always volunteering me for everything and for giving me those opportunities to shine time and time again. These are just a few of the

 ISSN 2161-5546

women who have supported me, and I hope that I will be able to do the same for the generations to come.

Finally, I am not sure where I would be now without the people in my life who have raised me both literally and figuratively, taught me and believed in me all along. These are the people whose shoulders I really do stand on – men and women alike. I want to acknowledge, of course, first and foremost my family. My parents sacrificed so much, so that I could have so much more. They taught me the importance of hard work and of doing your best in all that you do. They made sure that neither my gender nor the color of my skin would ever keep me from succeeding in life, but they also made sure I knew where I came from. I want to thank my brother, who always been there to help me along the way, and even now, still has to be my pulmonologist on-call through a pandemic. Thank you to all my teachers and in particular, my attendings at Baylor who inspired me to be a cornea specialist and equipped me with a solid foundation. Thank you, Mark Terry, for trusting in me enough to give me my first job. And of course, to Ivan Schwab and Mark Mannis, thank you for making me a corneal surgeon, for supporting my career at every step, and for teaching me so much more than just ophthalmology. And to all of former residents and fellows, and to all of my friends – thank you for always pushing me to be the best version of myself. I have learned so much from each of you and I am forever grateful.

Well-behaved women seldom make history… Let's go make history together!

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