AN INSIDE LOOK AT INNOVATIONS IN OPHTHALMOLOGY

Innovation Journal Club explores recently published and presented data around innovations in eye care with a focus on how they might shape real-world practice.

In the *Innovation Journal Club* series on Eyetube.net, host I. Paul Singh, MD, of The Eye Centers of Racine & Kenosha in Wisconsin, interviews leading experts from across eye care subspecialties about emerging innovations and technologies that may prove influential to the real-world practice of ophthalmology. The series is editorially independent (supported by advertising from multiple companies), which allows the discussions to be broad in scope and candid in presentation.

The following is a summary of three episodes in which Dr. Singh sat down with Arjan Hura, MD, of the Maloney-Shamie Vision Institute in Los Angeles to talk about innovations in ergonomics; Dagny C. Zhu, MD, owner and medical director of Hyperspeed LASIK (an NVISION company) in Rowland Heights, CA, to discuss how practitioners today can leverage social media; and Sila Bal, MD, MPH, of Mass Eye and Ear in Boston, to learn about getting involved in research.

INNOVATIONS IN ERGONOMICS

WITH ARJAN HURA, MD

As Arjan Hura, MD, advanced through his training and early years in ophthalmology, he noticed a lot of his mentors and older colleagues discussing the same thing: the importance of starting early in establishing good surgical ergonomics. As he explains to host I. Paul Singh, MD, in this episode of *Innovation Journal Club*, being proactive about proper health and wellness is an investment in longevity: you don't have to be old to get injured from repetitive muscular stress.

HOW HE GOT INVOLVED IN RESEARCH

Like many undergraduate students who intend to apply to medical school, Dr. Hura knew his CV would benefit from experience with research. A family friend who was a nephrologist invited Dr. Hura to help with nephrology research in his lab one summer. That exposure gave Dr. Hura insight into how an MD/PhD runs a lab, in addition to gaining experience with immunohistochemistry and histology.

After his first year in medical school, an opportunity to assist with pediatric pulmonology research at the Cincinnati Children's Hospital exposed Dr. Hura to multi-industry collaboration. His team met weekly with engineers, sleep scientists, pulmonologists, statisticians, and other specialists. He also saw clinical patients.

"I got to see the procedures that were being done in the OR, and then I was back in the lab. I got to see that whole translational aspect of research," he explained to Dr. Singh.

It wasn't until his third year of medical school that Dr. Hura decided to pursue ophthalmology, yet he had no contacts in the field whom he could approach about research opportunities. After sending cold e-mails to many individuals, one responded with a timely opportunity—Robert Osher, MD. Then, prior to starting his internship year in Columbus, OH, Dr. Hura reached out to Alice Epitropoulos, MD, whose talk on IOL optics he'd previously attended as a medical student, and she offered him a chance to do research in dry eye disease.

STUDYING ERGONOMICS IN THE OR

Throughout his medical training and now as a practitioner, Dr. Hura said he has heard innumerous talks on the ergonomics of performing surgery. As he told Dr. Singh, "I noticed that it was always people older than me giving these talks, and they also made the same points: You have to start

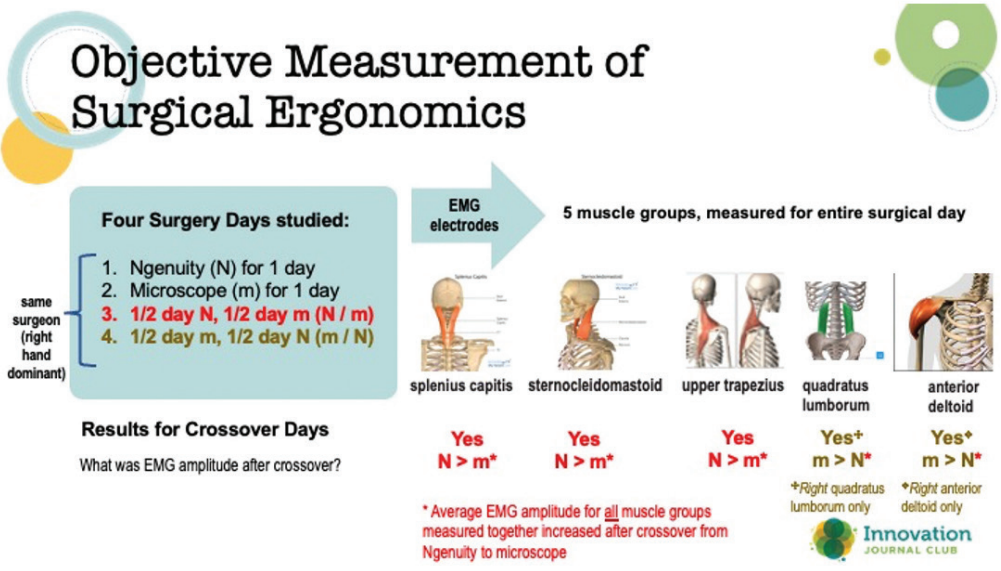

Figure 1. Overview of a clinical method study in which EMG amplitude was measured on a single surgeon using either a microscope or heads-up view, as well as on crossover days from one viewing method to the other.

early, and you have to be diligent about the measures you're taking to protect your body." Dr. Hura notes that several studies have concluded that 40% to 80% of ophthalmologists will be impacted by cervical or lumbar pain that will interfere with their ability to work.[1-7] In 2019, at the annual meeting of the AAO, Dr. Hura attended a Learning Lounge panel discussion that included Chris Riemann, MD, one of his retina attending physicians at the Cincinnati Eye Institute. Dr. Riemann advocated using the 3D heads-up display to perform ocular surgery for ergonomic benefits. Afterward, Dr. Hura and Dr. Riemann were talking. "And I just happened to wonder out loud if anyone has looked at 3D heads-up display with EMG. And you know Chris, he was game."

Dr. Hura found no papers in the ophthalmic literature in which researchers had quantified median amplitude EMG signals for specific muscle groups while a subject was performing surgery. So, Dr. Hura and Dr. Riemann conducted an investigator-initiated clinical method study in which electrodes were placed on Dr. Riemann's back over a 4-day period to learn which muscles were being stimulated during surgery. On one day, Dr. Riemann operated using the operating microscope exclusively; on another day, he exclusively used a 3D heads-up display. Plus, there were two crossover days, where Dr. Riemann would use one method in the morning and the other method in the afternoon. All four days were spaced about 1 week apart. When Dr. Riemann used the 3D heads-up display, most muscle groups measured showed a reduction in amplitude compared to when he operated with the traditional microscope (Figure 1). Anecdotally, he also reported experiencing less fatigue.

Although Dr. Hura has submitted this study's data for publication, he plans to continue the research. "Eventually, I'd like to compile the footage of him [performing surgery] from posterior to anterior and laterally that was recorded in 4K on tripods in the operating room … into a four-split-screen view. I'd like to be able to demonstrate how he's moving in space, what his hands are doing, and what muscles are firing with each motion."

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INNOVATIONS IN SOCIAL MEDIA

WITH DAGNY C. ZHU, MD

Is social media a help or hindrance in the practice of ophthalmology? In this episode of *Innovation Journal Club*, ophthalmologist and social media expert Dagny C. Zhu, MD, shares her recent research on how eye care practitioners are using social media. She talks with host I. Paul Singh, MD, about how doctors can harness social media platforms to connect with patients and peers.

HOW DR. ZHU FIRST GOT INVOLVED IN SOCIAL MEDIA

During the gap year between graduating from her medical training and purchasing a large refractive surgery practice, Dr. Zhu decided to learn how to use social media to reach prospective patients. As she told Dr. Singh, "I understood that to be successful these days, you should have a presence or brand online for patients to find you. You don't wait for them to knock on your door." At the time, Dr. Zhu didn't have an Instagram account; a relative helped her get on the platform and showed her how to create posts and stories.

She now uses this tool for educational purposes, and she believes that, for physicians, branding oneself on social media is foremost about establishing credibility and expertise. "You want to be viewed as someone who's knowledgeable about your specialty," she said. Her second objective is to be personable and relatable to her audience. She shares aspects of her personal life that paint a larger picture of the person she is: female physician, practice

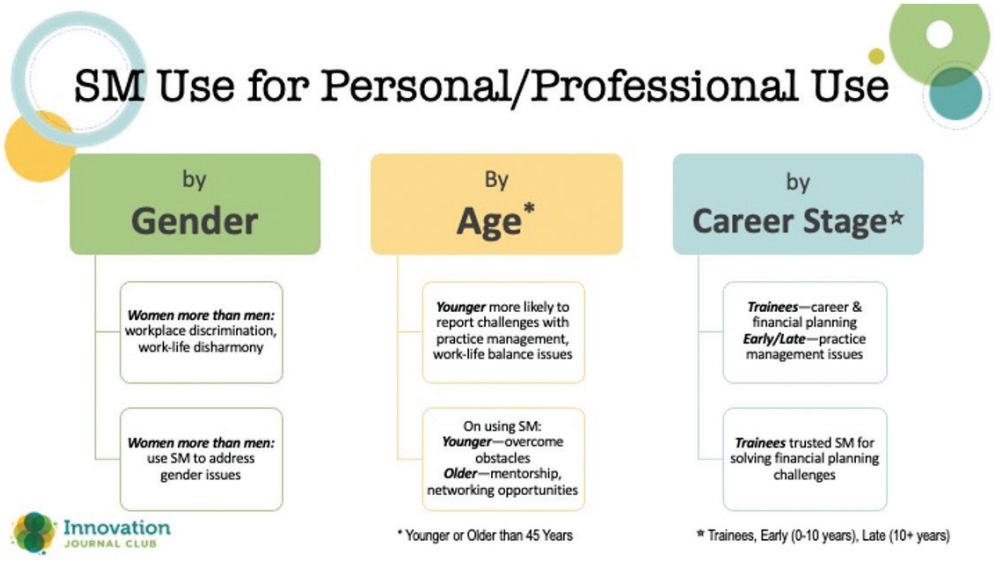

Figure 2. In one of three research studies on SM published by Dr. Zhu this year, the authors sought to understand usage patterns by gender, age, and experience in the field.

owner, mother, and immigrant. "I share a lot about my immigration story," she tells Dr. Singh. "I hope to provide a beacon of hope to people who are going through the same thing. So, my brand, it's not all about marketing and pushing my practice and my services. It's about me as a whole."

Dr. Zhu says that while digital marketing efforts have helped bring in refractive surgery patients with each viral video, a large number of her patients are students and colleagues who have followed her for years and have chosen her as their surgeon. Establishing this trust and rapport early, Dr. Zhu says, makes it easier for her in the exam room to talk honestly with the patient about his or her visual needs and the treatments she recommends.

DR. ZHU'S PUBLISHED SURVEY

Dr. Zhu and colleagues published three papers this year on the use of social media in ophthalmology, two of which she described to Dr. Singh.

The first article was a survey of social media usage among ophthalmologists during the COVID-19 pandemic.[1] In fact, the idea for the survey developed through social media—two medical students had messaged Dr. Zhu on her Instagram account to ask if she would be willing to conduct research with them. In 2020, the team sent a cross-sectional survey via social media channels to ophthalmologists asking them about their reasons for using social media (ie, personal, professional, educational, mentorship, networking, etc.). Dr. Zhu and the students then categorized the respondents by gender, age, and career stage. Perhaps expectedly, younger practitioners use social media to learn real-world skills, such as financial literacy, and to connect with mentors in their professions. More established physicians, meanwhile, tend to use their platforms to educate patients as well as colleagues. Interestingly, women were more likely than men to use social media as a tool for finding communities of support and achieving work-life harmony (Figure 2).

Earlier this year, Dr. Zhu published an article in the *Journal of Clinical Ophthalmology* titled Ophthalmology and Social Media: An In-Depth Investigation of Ophthalmologic Content on Instagram.[2]

"It was the first of its kind," she told Dr. Singh. With that study, Dr. Zhu and colleagues were trying to pinpoint what types of ophthalmic content went "viral" or had greater levels of engagement. They found that static images that featured objects (eg, a fundus) instead of people and educational content that contained no relatable personal experience (eg, an anecdote about the patient's backstory or how the physician handled a case) had the least engagement. Dr. Zhu offered one tidbit: to boost the engagement of an Instagram post, wear a white lab coat. "It establishes your authority," she says.

Dr. Zhu was also an author on a paper published in 2022 looking at how patients use Reddit to ask and address eye-related medical questions in place of a professional consultation.[3]

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GETTING INVOLVED IN RESEARCH

WITH SILA BAL, MD, MPH

Responding to feedback received from viewers, *Innovation Journal Club* dedicated an episode to getting involved in research. Dr. Singh invites Sila Bal, MD, MPH, currently a cornea fellow at Mass Eye and Ear transitioning to private practice, to discuss how she got started in research and what advice she could offer to peers interested in getting involved. They discuss a paper published by Dr. Bal as a case example of how a research study moves from concept all the way through to publication.

HOW DR. BAL GOT INVOLVED IN RESEARCH

While in her undergraduate studies, Dr. Bal had the opportunity to participate in bench research. And, she says, it was never something she felt passionate about. But then she was asked to participate in a clinical research study by an influential mentor, Gil Binenbaum, MD, who helped demonstrate the possibility for research to impact the practice of medicine and improve the lives of patients. Suddenly, everything changed for Dr. Bal.

"That's one thing you want to discover early on, whether you really love the basic science research, or whether you're like me, and you prefer clinical research," Dr. Bal offered.

From there, Dr. Bal followed her passion, initially focusing on research in pediatric patients, which eventually evolved into an interest in international public health.[1-4] Those studies may not have landed in the highest of impact journals in ophthalmology; however, she said, they looked at issues such as access to care and disparity in displaced populations, "and that is what is most special to me."

Dr. Bal is pointed in crediting her mentors for introducing her to research, as well as for teaching her the nuances of how clinical trials are run. Early on she had to do the "grunt work" involved in research, but as she proved herself, opportunities became more readily accessible.

Tune into the episode for the full discussion between Drs. Bal and Singh, in which they discussed the role of the Institutional Review Board, the advent of big data and how consortium efforts like Intelligent Research in Sight (IRIS) can impact eye care, and the pros and cons of conducting research in private practice versus academic settings.

STUDYING RD RATES IN OCULAR COLOBOMA

At the suggestion of Dr. Binenbaum, and because she was interested in pediatric work at the time, Dr. Bal led a study to understand the risk of retinal detachment (RD) in children with ocular coloboma.[5]

Prophylactic retinopexy is often used in this setting to mitigate the risk of RD but comes at the expense of damaging retinal tissue. Underlying the study was the question of whether retinopexy was necessary for patients with ocular colobomas. For the study, a retrospective chart review was performed among patients with optic nerve (ONC) or chorioretinal coloboma (CNC); data were collected on 387 eyes of 258 children (ONC = 288 eyes; CNC = 236; both = 137). The median age was 2.1 years at the time of the first/only exam, and patients were 7.4 years old at the latest follow-up.

Somewhat surprisingly, the team found dramatically lower rates of acquired RD than expected: 0.52% per eye and 0.78% per patient compared to a range of 4% to 18% in previous studies.[6-8] Based on their findings, the team suggested that screening exams are warranted, but the role of prophylactic retinopexy is uncertain. The difference may be that historical studies were largely single-center series, whereas the current study was broader in scope.

"Our dataset was multinational where we had more patients, a more diverse group of patients, so we're probably seeing a more representative population of patients," Dr. Bal explained. "I don't know that it has completely changed practice patterns just yet. We need bigger data studies to really answer those questions about the role of prophylactic retinopexy. But it's a good starting point where we can say the rate [of acquired RD] is lower than what we previously thought." ■

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