



February 3-6, 2023 | JW Marriott Los Cabos Beach Resort & Spa

2023 CARIBBEAN EYE MEETING

The Annual ACES/SEE Caribbean Eye Meeting delves into hot topics for anterior segment surgeons and health care professionals.

The 2023 Caribbean Eye Meeting promises to be as engaging as in previous years. This one-of-a-kind meeting, held at the JW Marriott Los Cabos Beach Resort & Spa, will gather well-known leaders in ophthalmology to discuss important topics in eye care against the beachfront backdrop where the Sea of Cortez meets the Pacific Ocean. The American College of Eye Surgeons (ACES) and the American Board of Eye Surgery (ABES) were started in 1989, with ACES as the educational arm. Together, ACES, ABES, and SEE share a commitment to the belief that the primary focus for today's ophthalmologist must, and should, be to promote, encourage, and enhance quality ophthalmic surgical care for the benefit of all patients.

PEARLS FROM THE DEEP: 3D VISUALIZATION SYSTEM SURGERY—OBJECTIVE ERGONOMICS

By Arjan Hura, MD, and Christopher Riemann, MD

Nearly 50% of ophthalmologists will experience musculoskeletal issues during their careers, most notably cervical and lumbar pathology, due to poor ergonomics challenges inherent in the OR and clinic.¹⁻⁷ One way to improve ergonomics in the OR is to use a 3D heads-up display.

The Cincinnati Eye Institute and the Departments of Neurology and Ophthalmology at the University of Cincinnati in Ohio conducted a clinical methods study to objectively quantify and subjectively expound the differences in ergonomics associated with 3D screen-based surgery and surgery using the oculars of a traditional microscope. The objective results of our study showed increased muscular fatigue and overall activity of the posterior chain postural musculature on EMG for all measured muscles except for the anterior deltoids and right quadratus lumborum when a traditional microscope (Leica F40, Leica) was used versus 3D heads-up display (Ngenuity 3D Visualization System, Alcon; Figure).

The study included four arms, two of which were crossover in nature. For the non-crossover arms, the surgeon exclusively conducted all surgeries for a single day using Ngenuity and, on a separate day,

exclusively with the traditional microscope. For the initial crossover arm, surgeries for the first half of the day were conducted with Ngenuity and then with the traditional microscope for the second half of the day. The subsequent crossover arm was reversed. EMG electrodes were affixed to five muscle groups (left and right): the splenius capitis, sternocleidomastoid, anterior deltoid, upper trapezius, and quadratus lumborum muscles. A subjective assessment of the level and location of potential discomfort was administered every 10 minutes for the first 30 minutes of a surgical case followed by every 15 minutes thereafter, at the end of each surgery, and at the end of each surgical day.

Surgery was performed during the COVID-19 pandemic, creating limitations with scheduling. For the first crossover arm, there was a statistically significant increase in median amplitude signals for all muscles except for the right anterior deltoid and right quadratus lumborum when switching from 3D heads-up display to a traditional microscope. The greater activation of the right anterior deltoid could be because the surgeon was in a more reclined position, which required his arms to be extended in front of him to reach the operative eye. The greater activation of the right quadratus lumborum when using 3D heads-up display could be due to the lateral flexion of the spine present when looking at the display, which was located 20° to 30° to the surgeon's right side. For the second crossover arm, the right anterior deltoid and quadratus lumborum again showed greater activation when using the 3D heads-up display relative to the traditional microscope.

Average EMG amplitude for all muscle groups on the first crossover arm increased statistically significantly when the doctor transitioned from 3D heads-up display to the traditional microscope. A similar increase was noted on the second crossover arm when the doctor transitioned from the traditional microscope to 3D heads-up display, but it was not statistically significant. This suggests a mitigation in progressive fatigue throughout the day.

CONCLUSION

Ergonomics matters. Surgery with a 3D heads-up display may help surgeons sustain longer careers by maximizing ergonomic potential. ■

1. Chatterjee A, Ryan W, Rosen E. Back pain in ophthalmologists. *Eye*. 1994;8:473-474.
2. Al-Marwani Al-Juhani M, Khandekar R, Al-Harby M, Al-Hassan A, Edvard DP. Neck and upper back pain among eye care professionals. *Occup Med (Lond)*. 2015;65(9):753-757.
3. Dhimitri KC, McGwin G Jr, McNeal SF, et al. Symptoms of musculoskeletal disorders in ophthalmologists. *Am J Ophthalmol*. 2005;139(1):179-181.
4. Hyer JN, Lee RM, Chowdhury HR, Smith HB, Dhital A, Khandwala M. National survey of back & neck pain amongst consultant ophthalmologists in the United Kingdom. *Int Ophthalmol*. 2015;35(6):769-775.
5. Chams H, Mohammadi SF, Moayeri A. Frequency and assortment of self-report occupational complaints among Iranian ophthalmologists: a preliminary survey. *MedGenMed*. 2004;6(4):1.
6. Kaup S, Shivalli S, Kulkarni U, Arunachalam C. Ergonomic practices and musculoskeletal disorders among ophthalmologists in India: an online appraisal. *Eu J Ophthalmol*. 2020;30(1):196-200.
7. Kitzmann AS, Fethke NB, Baratz KH, Zimmermann MB, Hackbarth DJ, Gehrs KM. A survey study of musculoskeletal disorders among eye care physicians compared with family medicine physicians. *Ophthalmology*. 2012;119(2):213-220.

ARJAN HURA, MD

- Associate, Cleveland Eye Clinic, Brecksville, Ohio
- drhura@clevelandeyeclinic.com
- Financial disclosure: Consultant, Speaker, Grant funding (Alcon)

CHRISTOPHER RIEMANN, MD

- Partner Physician, Eye Care Partners
- Vitreoretinal Fellowship Director, Cincinnati Eye Institute, Ohio
- criemann@cvphealth.com
- Financial disclosure: Consultant, Speaker, Grant funding (Alcon)



Figure. Proper positioning during 3D heads-up surgery with the Ngenuity 3D Visualization System.



To learn more about the 2023 Caribbean Eye Meeting and register to attend, visit
CaribbeanEyeMeeting.com

