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CORRESPONDENCE

Simple lighting system to improve compliance of surgical timeout

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Surgical timeout is widely recognized as an important safety step but frequently overlooked.[1–3] Surgical mistakes in all specialties may include operating on the wrong patient, wrong organ, incorrect side, and wrong procedure.[4] A high volume and high turnover increase the potential for errors.[5]

In ophthalmology, there are many reports of mistakes at the time of cataract surgery in the use of the wrong implant power, wrong implant type (aspheric, toric, multifocal, or extended-depth of focus), and wrong axis of astigmatism.[6] In laser vision correction, there are numerous reports of data entry errors including the wrong refractive error (sphere, cylinder, and/or axis), wrong optical zone and/or transition zone, and incorrect goal of distance vision vs undercorrection.[7] In pediatric ophthalmic surgery, there are reports of operating on the wrong eye or wrong procedure secondary to confusion between the type of deviation (esotropia/exotropia) and/or surgical procedure (recession/resection).[8]

Mistakes may result in serious irreversible complications for a patient and stress for the surgeon that may also include complaints to a local College of Physicians and Surgeons and/or legal action. The amount of hardship for all involved cannot be minimized. Anything that can be performed to decrease surgical complications should be embraced by surgeons in every specialty.

A simple physical reminder for the operating room may help ensure compliance of a surgical timeout. This can be in the form of a light source that is battery operated and can be changed from red to green to indicate that a surgical timeout has been completed. If followed, it may be almost impossible to forget this critical safety step. A single detachable light can be controlled by a remote control to change the color of the light. This is an inexpensive device that can be ordered online or purchased in hardware or other shops.

Prior to a patient entering the operating room, it can be the responsibility of the circulating nurse or technician to be sure that the red light is on. This indicates that the surgical timeout has not been completed. A nurse or technician completes the standard surgical timeout. The surgeon then reviews the check list of important information. It is only now that the light can be changed from red to green. A green light indicates to everyone in the operating room that the surgical timeout has been completed and that surgery can proceed.

I adopted this lighting system for all my surgical procedures over the past 6 months and have not had a single case in which a surgical timeout was not accurately completed. In the case of cataract surgery, the light is placed on a wall near the patient's medical record. The circulating nurse has the responsibility to be sure the light is red before the patient enters the operating room. After the surgical timeout has been completed, which includes identifying the correct patient, eye, and implant power, the surgeon, nurse, or technician presses the remote to change the light to green (Figure 1). The green light is seen by everyone in the operating room and signals that the surgery can proceed.

When performing laser vision correction, the light is attached to the edge of a computer monitor on the laser (Figure 2). The technician or nurse will perform a standard timeout. After the surgeon performs a surgical timeout, which includes being sure of the correct patient, eye, intended refractive correction, and optical zones and transition, then the green light is activated, and the procedure can start (Figure 2).

This colored light system can be adopted in ophthalmology and other surgical specialties to serve as a powerful

Figure 1. In the cataract operating room, prior to the patient and surgeon coming in to the room the light is red. After the surgeon completes the surgical timeout and reviews the IOL, the light is changed to green.

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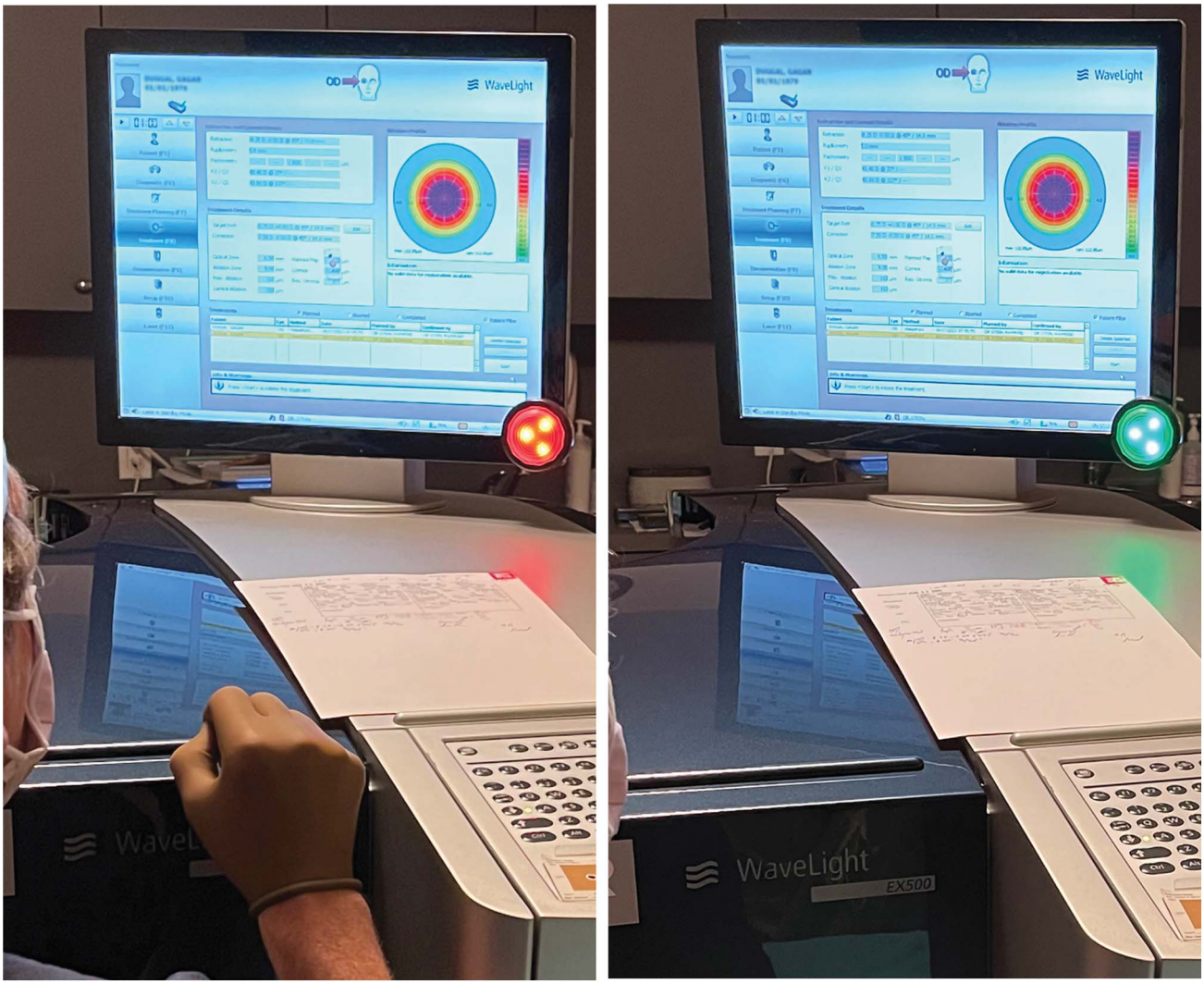

Figure 2. In the laser vision correction room, when the surgeon enters the room, the light attached to the computer monitor is red. After the surgeon completes the surgical timeout and reviews the computer entry data, the light is turned to green.

physical reminder to complete the surgical timeout. Avoiding preventable surgical complications is our goal. A simple colored lighting system of a red and green light has the potential to enhance compliance of the surgical timeout and decrease potential serious complications. Since the introduction of traffic lights and stop signs in countries around the world, the incidence of motor-vehicle accidents and mortality has been reduced. We owe it to our surgical patient to do better.

REFERENCES

1. Biffl WL, Gallagher AW, Pieracci FM, Berumen C. Suboptimal compliance with surgical safety checklists in Colorado: a prospective observational study reveals differences between surgical specialties. Patient Saf Surg 2015;9:1–8
2. Muensterer OJ, Kreutz H, Poplawski A, Goedeke J. Timeout procedure in paediatric surgery: effective tool or lip service? A randomised prospective observational study. BMJ Qual Saf 2021;30:622–627
3. Rydenfält C, Ek Å, Larsson PA. Safety checklist compliance and a false sense of safety: new directions for research. BMJ Qual Saf 2014;23:183–186
4. Neily J, Mills PD, Eldridge N, Dunn EJ, Samples C, Turner JR, Revere A, DePalma RG, Bagian JP. Incorrect surgical procedures within and outside of the operating room. Arch Surg 2009;144:1028–1034
5. Azuara-Blanco A, Reddy A, Wilkinson G, Flin R. Safe eye surgery: non-technical aspects. Eye (Lond) 2011;25:1109–1111
6. Parikh R, Palmer V, Kumar A, Simon JW. Surgical confusions in ophthalmology: description, analysis, and prevention of errors from 2006 through 2017. Ophthalmology 2020;127:296–302
7. Simon JW, Ngo Y, Khan S, Strogatz D. Surgical confusions in ophthalmology. Arch Ophthalmol 2007;125:1515–1522
8. Maloley L, Morgan LA, High R, Suh DW. Wrong-site surgery in pediatric ophthalmology. J Pediatr Ophthalmol Strabismus 2018;55:152–158

Disclosures: *None reported.*

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