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Effective Stimulators for Intraoperative Visual Evoked Potentials

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Dear Editor,

The review by Rajan et al. [1] provides an excellent introduction to and overview of intraoperative visual evoked potentials. The authors point out many of the shortcomings of certain types of visual stimulators when employed intraoperatively. Generally, these devices consist of reusable goggles with embedded light emitting diodes.

In my experience problems include:

1. A reusable device must be cleaned in between patients.
2. Tightly fitting goggles pose a risk of damaging the eyes.
3. Goggles may fall off the eyes or move intraoperatively and be difficult to reposition once the procedure is underway.

4. The light emitting diodes utilized, tend to be too weak to produce an adequate stimulus.
5. Straps or bands interfere with other aspects of patient care

Rajan et al. speculate that better stimulus methods may be useful to more reliably record intraoperative VEPs.

There is an FDA approved visual stimulator, designed for superior performance in the operating room presently available commercially. The SightSaver™ is a novel visual stimulator consisting of: Adhesive foam padding shaped to the contours of the periocular region attached to a printed circuit board with specially selected high intensity light emitting diodes; and a cable interface compatible with standard intraoperative neurophysiology systems (**Figure 1**).



Figure 1 FDA approved visual stimulator.

This design has several key advantages over standard goggle stimulators:

1. Hygienic advantages - being disposable it eliminates the necessity of cleaning and sterilization in between patients. Reusable stimulating goggles must be carefully cleaned and preferably sterilized after each use in the operating room. Additionally, some bodily fluids are extremely difficult to remove without damaging the reusable stimulating goggles. Using a disposable self-adhesive visual stimulator eliminates such problems.
2. Ocular safety - Reusable stimulating goggles, may damage the eye, especially during procedures where the patient is placed face down. It has even been specifically recommended that any type of goggles be avoided during prone spine surgery as the risk is excessive [2]. SightSaver™ consists primarily of foam padding and actually physically protects the eyes rather than increasing the risk of damage caused by goggles.
3. The form fitting and self-adhesive characteristics of the SightSaver™ result in more effective acquisition of data.

Reusable stimulating goggles are fastened to the patient's head with rubber straps. These straps may interfere with the surgical approach or other monitoring equipment. Additionally, stimulating goggles may be accidentally moved from their original position during the operation, as the head is manipulated. It is often impossible to replace the goggles once the surgery has begun. SightSaver™ does not have a strap and the adhesive properties of the SightSaver™ nearly eliminate any chance of the stimulator moving as the head is manipulated.

- The specifically chosen high intensity light emitting diodes provide a stronger stimulus than goggles.

An ultra-low profile version of the device is also available (**Figure 2**). The SightSaverMini™ does not provide the same level of physical protection to the orbit, but allows for additional intracranial surgical approaches or other situations where less bulk is desirable [3-5].



Figure 2 Ultra-low profile version of the device.

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