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### Using pattern ERG to objectively measure contrast sensitivity associated with intraocular lenses

**Statement of the Problem**: Multifocal intraocular lenses provide distance and near vision without spectacle correction but often at the cost of loss of contrast sensitivity. Previous testing for contrast sensitivity utilizes subjective response from patients and is difficult to quantify.

**Purpose:** To use pattern electroretinogram (pERG) to quantify contrast sensitivity (CS) with monofocal vs. multifocal intraocular lenses (IOLs).

**Methods:** Pattern ERG was performed on 5 healthy eyes of 5 patients through an extra-ocular lens apparatus that directed the image through no IOL (control), plano trial lenses, monofocal IOL, and multifocal IOL. Stimulus image was kept constant at a 20/200 level, while contrast was progressively decreased from 100% to 95%, 90%, 85%, 80% and 75%.

**Results:** The response curve was statistically lower in plano vs. no lens (p=0.0001), demonstrating that any lens in the system served to block some light from entering the eye; in multifocal IOL vs. plano, (p=0.0000) as well as in multifocal IOL vs. monofocal IOL (p=0.0005), demonstrating that multifocal IOL decreased contrast sensitivity compared to monofocal IOL and plano-lenses. The decrease was in between 25% to 45%. The response curves were not statistically different between monofocal IOL and plano (p=0.5064), demonstrating monofocal IOLs did not reduce contrast sensitivity as compared to plano set up.

**Conclusion:** Multifocal IOL decreased perception of contrast in patients more than monofocal IOL. For the first time, we have objective measurements to quantify the loss of contrast sensitivity.

#### **Biography**

Kenneth Lu is an Assistant Professor of Ophthalmology at Doheny Eye Institute, University of California, Los Angeles, specializing in Cataract and Refractive Surgery. He has a special interest in the new technology IOLs. He holds a patent on the Ojo accommodating IOL and is the founder of the annual Innovations and Entrepreneurship: Ideation to Commercialization Conference at Doheny Eye Institute. He is also an investor as well as an entrepreneur/innovator. His research area ranges from electrophysiology, glaucoma to refractive cataract surgery.

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