■ Filtering epileptogenic sequences from video material

Chronic modulation may modify photosensitive epilepsy. Parra et al. propose a novel digital filtering technique that eliminates potentially epileptogenic content of a video sequence related to color without altering its spatial and luminance content.

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■ “Deep Red” alert—The visual system is under attack: The role of color

Commentary by Giuseppe Erba, MD

Photosensitivity, a genetic trait transmitted as autosomal dominant with maximal penetrance in youth, is characterized by the photo paroxysmal response (PPR) in the EEG and by a hyperexcitable visual-motor system. Photically induced seizures may occur when the retinal receptors of susceptible individuals are exposed to provocative stimuli. These include: flashes at frequency greater than three per second; opposing changes in luminance in excess of 20 candelas/m²; a combined flashing area that occupies more than 25% of the central field of vision, and the wave length—particularly the “deep red” in the long frequency band of the visual spectrum. Broadcasting guidelines recommending avoidance of these parameters have been adopted in the United Kingdom and Japan, with proven reduction of seizures.¹ Compared to the traditional 50 Hz screens used in Europe and 60 Hz screens used in

the United States, these 100 Hz screens by producing a flicker perception above the photosensitivity range also have a protective effect.

The paper by Parra et al. in this issue of *Neurology* addresses specifically the role of color modulation as yet another critical mechanism of the PPR. Their findings confirm that the Pokemon incident in 1997 was caused by exposure to a 4-second sequence of red/blue images flashing at the rate of 12 Hz and occupying 80% of the screen area. It is interesting that the same device the authors used proves their point and becomes a preventive tool. This digital nonlinear filter that automatically eliminates all color modulations that are in excess of a preset risk threshold should work as an ideal complement to the other online filter available in the United Kingdom, specifically designed to identify transgressions to the guidelines in

animated programs prior to being aired on TV.²

Clearly, the search for strategies that will provide image safety to all consumers is on, but no one approach will satisfy all needs. While we are waiting for a global, coordinated policy, clinicians should note new hazards in an ever-changing environment. Innovations such “virtual reality” that allows video game players to vary visual stimuli in infinite and unpredictable combinations present a challenging problem that even the most advanced online analyzers will not resolve.

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