

AbstractID: 13457 Title: Comparison of the visual fatigue with a high-brightness color LCD and a monochrome LCD

**Purpose:**

To investigate whether there are the differences among the visual fatigue of observers in the 500 cd/m<sup>2</sup> color and the monochrome LCDs and the 170 cd/m<sup>2</sup> color LCD (two-mega pixels).

**Method and Materials:**

Posteroanterior chest radiographs with a lung nodule were displayed on a high-brightness color LCD (Radiforce RX211, Eizo) with two maximum luminance settings (500 and 170 cd/m<sup>2</sup>) and a monochrome LCD (500 cd/m<sup>2</sup>, Radiforce GS220, Eizo). Six radiologic technologists aged 24.0±1.3 years were independently trained to understand various lung nodules for two hours, deemed the "Fatigue Session". The visual fatigue of observers was evaluated in terms of the critical flicker fusion frequency (CFFF) and the visual accommodation time by use of a flicker device (Handy Flicker HF, Neitz) and an accommodation device (HS-9E, Kowa), respectively. The measurement of the degree of visual fatigue was performed before and after the Fatigue Session for each observer. Both the decrement of the CFFF and the extension of the accommodation time were utilized as a measure of visual fatigue. The ambient lighting was set at 35 lux during all Fatigue Sessions and the measurement of visual fatigue.

**Results:**

The average visual fatigue that analyzed both the CFFF and accommodation time increased after the Fatigue Sessions. The CFFF with the 500 cd/m<sup>2</sup> color, monochrome LCDs, and the 170 cd/m<sup>2</sup> color LCD decreased 3.7, 3.9, and 5.6%, respectively. The accommodation times after the Fatigue Sessions with the 500 cd/m<sup>2</sup> color, monochrome LCDs, and the 170 cd/m<sup>2</sup> color LCD were extended by 18.5, 18.1, and 3.2%, respectively.

**Conclusion:**

In terms of the decrement of the CFFF, there were little differences among the three monitor conditions. On the other hand, the extension of the accommodation time with the 500 cd/m<sup>2</sup> color and monochrome LCD was longer than that of the 170 cd/m<sup>2</sup> color LCD.