

AbstractID: 10498 Title: Does new lightweight leaded eyewear provide adequate radiation protection for fluoroscopists?

Purpose: Leaded eyewear is commonly recommended for physicians routinely performing interventional fluoroscopy procedures. However, radiation-attenuating glasses and goggles can be heavy and uncomfortable. Recently, several new lightweight eyewear designs have become available. Two such designs were investigated to determine how well they are able to reduce eye dose under clinical conditions.

Materials and Methods: The eye dose was measured using OSL nanodot dosimeters positioned on a Rando head phantom. The phantom was positioned next to an acrylic phantom to duplicate the position of an operator exposed to scattered x-rays. Eye dose was measured with and without leaded eyewear in three different positions: head directed toward the scatter volume and angled 45 and 90 degrees. The eyewear investigated included standard style glasses with 0.75 mm lead equivalent lenses (Type A), sport-wrap glasses with 0.75 mm lead equivalent lenses (Type B) and a panorama shield with 0.07 mm lead equivalent acrylic lenses (Type C).

Results: With the phantom head directed toward the scatter volume, the eye dose was reduced by 90%, 88% and 61% for Type A, B and C, respectively. Each value is lower than expected from the attenuation of the lenses alone, indicating backscatter is a significant contribution. At 90 degrees, eye protection dropped somewhat for Type A (75%), significantly for Type B (31%), while remaining the same for Type C (61%). The poor protection afforded by Type B at 90 degrees was primarily due to limited side coverage.

Conclusion: Even though the lead equivalent thickness of Type C is much lower than other designs tested, increased side coverage resulted in nearly equivalent eye dose reduction when side exposure was predominant. The use of 0.75 mm lead equivalent lenses appears to have diminishing returns given that backscatter and side exposure are a significant source of eye exposure.