Can you hear me now? The smartphone may be a reliable instrument for measuring workplace noise exposure

By Michael H. Weier ■ July 28, 2016

ccupational hearing loss is a significant source of claims for state and federal workers' compensation benefits.[1] Each year, approximately 30 million people in the United States are exposed to hazardous workplace noise. For nearly three decades, the Occupational Safety and Health Administration (OSHA) lists noise-related hearing loss as one of the most prevalent occupational health concerns. The Bureau of Labor Statistics similarly reports nearly 125,000 U.S. workers have suffered significant, permanent hearing loss over the past decade.[2]

Determining the level and duration of workplace noise is of primary importance to employers, workers, industrial hygienists, audiologists and otolaryngologists. Frequently, occupational noise exposure must be inferred or extrapolated from historical or post-exposure acoustical assessments. The requisite noise surveys performed by industrial hygienists using sophisticated acoustic measurement equipment are time-consuming and expensive. A less costly, simple and accurate means of measuring environmental noise may be in our hands daily.

A mobile telephone is not simply a device that permits two or more users to verbally converse when they are too far apart to be heard directly. Advanced cellular technology allows us to use our smart phones to text, listen to music, play a game, get directions, take pictures, check e-mail, find the closest gas station or a great restaurant, surf the Internet, make credit card purchases, watch a movie or download an airline boarding pass.

Photographs and videos obtained on cells phones already have been entered into evidence in legal proceedings. Upon establishing the threshold legal requirements of authentication and relevance, environmental noise data obtained through cell phones will likely soon be similarly accepted by government agencies, administrative tribunals and courts.

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Two studies reported in the *Journal of Occupational and Environmental Hygiene* examine cell phone use as a reliable, accurate instrument to measure environmental noise exposure.[3]

In the first study, researchers Roberts, Kardous, and Neizel investigated whether or not Apple iOS devices (iPhones and iPods) could be used as reliable instruments to measure noise exposures. The researchers compared

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Can you hear me? (continued)

simultaneous noise level readings from cell phones with an external microphone and noise measurement applications from a Type 1 field sound level measurement system. The results revealed no significant statistical difference in noise level measurements obtained from the cell phones versus the sound level measurement system.

In the second study, Ibekwe and colleagues compared three Android smartphones (Samsung Galaxy Note 3, Nokia S and Techno Phantom Z) against a sophisticated sound level meter. Noise level readings with the meter and the mobile phones showed equivalent values.

In both studies, the researchers compared cell phone and sound level meter measurements in controlled, artificial settings. Additional research will be required to further validate and confirm the reliability of cell phone noise level measurements in "real world" industrial and occupational settings. Once that occurs, cell phones will undoubtedly be routinely used to measure occupational noise exposure levels. Moreover, the data is certain to be used by industry, hearing loss professionals, administrative tribunals and courts to evaluate and assess hearing loss claims for industrial insurance benefits.

Employers, insurers and administrators of state and federal workers' compensation programs are well-advised to keep abreast of cellular phone technology and their potential application for assessments of workplace noise levels. Please do not hesitate to contact (call!) one of the attorneys at Reinisch Wilson Weier PC with any questions regarding your company's use of cell phone technology to document workplace noise levels. ■

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[1] *Hearing Impairment Among Noise-Exposed Workers – United States, 2003 – 2012.* CDC Morbidity and Mortality Weekly Report, April 22, 2016, 65(15); 389–394, http://www.cdc.gov/mmwr (retrieved May 16, 2016).

[2] U.S. Department of Labor, Occupational Safety and Health Administration Website, https://www.osha.gov/SLTC/noisehearingconservation/index.html (retrieved May 16, 2016).

[3] Roberts B, Kardous C, Neitzel R. *Improving the Accuracy of Smart Devices to Measure Noise Exposure*. J Occup Environ Hyg., Vol 13, Issue 7, Jul 2016; http://www.ncbi.nlm.nih.gov/pubmed/27163833 (Epub May 10, 2016 ahead of print; retrieved May 16, 2016). Ibekwe TS, Folorunsho DO, Dahilo EA, et al. *Evaluation of Mobile Smartphones App as a Screening Tool for Environmental Noise Monitoring*. Occup Environ Hyg., Volume 13, Issue 2, February 2016, pages D31-D36; http://www.tandfonline.com/doi/abs/10.1080/15459624.2015.1093134 (retrieved May 18, 2016).