

A Low-Cost, Dosimeter Accessory Kit Enabling the Collection of Sound Level Measurements from within the Ear Canal

Background

Noise level in the workplace is a concern and is monitored by the Occupational Safety and Health Administration (OSHA). In many instances, providing some form of hearing protection is an easy solution for most workers subjected to sound exceeding acceptable limits. However, for professions that require the use of two-way communication such as police officers, firefighters and construction workers (all of which have a high level of noise-induced hearing loss (NIHL)), obtaining accurate measurements of sound level exposure to provide guidance for proper hearing protection has proven difficult. Currently, a dosimeter worn at shoulder level is used to establish levels of sound workers encounter during their shift. This measurement, though, does not accurately reflect the level of sound traveling to the ear canal. As such, an affordable, portable, and durable attachment that is adaptable to existing dosimeters and capable of measuring the sound level while any ear piece or headset is sending a signal into the ear canal would have significant utility. Such measurements would allow Environmental Health and Safety professionals to make recommendations founded on data, understand individual differences and work habits that would result in NIHL, and inform OSHA regulation development.

Technology

Researchers from the University of Wisconsin – Whitewater in partnership with the Center for Device Design and Development at UW-Fox Valley, have developed a set of low-cost, dosimeter attachments that allow for sound levels to be measured in the ear canal. By combining these novel attachments with commercially available dosimeters, a more accurate reading can be obtained that reflects the true exposure level of potentially harmful noise to the individual. With the current accessory kit, one of three attachments comfortably fits in the user's ear and connects to a standard dosimeter. Field tests have demonstrated that higher sound levels were recorded at the level of the ear canal using these attachments compared with the traditional method using a shoulder mounted dosimeter.

Ongoing Development and Commercialization Needs

Continued improvements are being made that focus on a reduction in ambient noise detection and better wearability and comfortability for the user. WiSys is currently seeking a strategic partner interested in providing a route to market for the commercialization and wide dissemination of its dosimeter attachment package as well as a partner for continued R&D around the development of further prototypes.

Applications and Key Benefits

- Low cost and adaptable to currently available dosimeters;
- Provides more accurate data of sound levels in the ear canal compared with traditional monitoring packages;
- Monitors sound levels encountered in the workplace by individuals using two-way communication devices;
- Improves safety in the workplace by preventing NIHL;
- Reduces both corporate and healthcare costs associated with NIHL through a reduction in worker compensation and insurance claims.

Intellectual Property

A Provisional Patent Application has been filed for this technology. For more information, please contact Jennifer Cook at jennifer@wisys.org or by phone at 608-316-4131.