Optimizing Your Medical Surveillance Program

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An employer asked me, "What steps should I take to optimize my medical surveillance program?" Great question! Health surveillance refers to the performance of medical tests on groups of workers who are exposed to hazards, to "be on the lookout" for problems. These particular hazards range from common risks like noise exposure, which causes hearing loss, to exotic ones, like exposure to the metal vanadium, which causes a green tongue and a cough! Single-issue exposures, such as asbestos, may require surveillance. Some multiple and unspecified hazards, such as hazardous waste operations (HAZWOPER), need it, too.

The first step a wise employer takes is to determine what hazards workers face. Industrial hygienists, such as those who may work for your insurer, can then measure the exposure dose. But the employer must first recognize the need to call an industrial hygienist. Systematically review incoming chemicals and new processes to identify those needing further study. Catalog every known and potential hazard. And, proactively ask employees what they notice, how they feel, and what concerns them about their work environment.

Some exposures require medical surveillance and others not. OSHA defines many of these in 29 CFR 1910 (Subpart Z). It lists about two dozen hazards which all require health-related testing. Again the OSHA Noise Standard 1910.95 is the most common of these.

Next, identify who is at risk. Map the areas of exposure on the plant's floor plan. Then have a hygienist perform testing of these areas, as well as personal monitoring of employees who work in or even pass through these parts of the plant. The hygienist will advise if exposure levels require surveillance.

The scope of this article can't scratch the surface of how to safely deal with these hazards, or how to perform surveillance for their medical effects. But it will explain **the single most important feature of an effective surveillance program.**

To learn what that is, let's again consider noise exposure. It provides a familiar example of how to manage a workplace hazard. The single best way to optimize a surveillance program for noise exposure is to systematically collect audiometric and noise dosimetry data, to systematically use it to find root-cause solutions for noisy areas, and to systematically share it with employees in ways that ensure they follow safe work practices. Hearing conservation programs that don't work in these systematic ways don't achieve their highest purpose, namely total prevention, and not mere recognition, of hearing loss. Instead they become mindless exercises in repeated hearing testing. Although they may identify hearing loss in an early stage, screening programs alone won't prevent it.

Surveillance is different from mere screening because the benefits accrue not just to the individual but to the entire work organization and the employer, too. Surveillance always involves screening, but screening unfortunately does not always lead to surveillance. A surveillance system collects and studies data with a purpose in mind, such as to use it as a "feedback loop" to ensure that employees are properly protected. For example, annual audiograms may identify individuals with standard threshold shifts (STS). A good hearing conservation program requires employees with STS to be retrained in use of hearing protective devices (HPD) and to be re-fit to ensure HPD are used to best advantage. And,

the program will study where in the work site the STS occurred, to identify if clusters of STS have developed, to track the incidence rate of STS, and to identify noisy areas that need remediation.

The opportunity to do true surveillance and not just repeated screening is especially important with chemical hazards. Your industrial hygienist can measure the levels of chemical contaminants in the environment, such as through air sampling. Your medical surveillance program can often measure internal levels of the same contaminants, in blood or urine samples from exposed employees. This type of "biological monitoring" assesses the internal dose to which the employee is exposed, which in turn relates to the external environmental dose that the industrial hygienist has measured. And, this can often be done well before these contaminants have any effect on health.

Several types of these "biomarkers" have been identified for various types of chemical hazards. One type, biomarkers of exposure, use direct measurement of the same chemical as in the environment, but in the body rather than in the air. Or they may measure metabolic breakdown products of that chemical. Another type, called biomarkers of effect, measure biochemical changes that occurs in the body as a result to exposure to the chemical.

By screening all exposed employees, and by systematically managing and reporting their data in a true surveillance program, the employer can be sure that employees are "doubly protected." First they are protected by the safety processes in place at the work site, which are verified by the industrial hygienist. Next employees are protected by measuring the absorbed dose of the chemical, which, if satisfactory, shows that the safety processes, including the individual employee's work habits, are effectively protecting them.

Hazard surveillance programs that use bio markers allow true preventive medicine. The interventions move far "upstream" rather than simply dealing with disease treatment far "downstream."

Most employers instinctively understand this in their hearing conservation programs. They identify areas that are excessively noisy. They perform engineering controls to eliminate the source of the noise. When the source can't be eliminated, they reduce exposure by substituting other processes, by erecting barriers and sound baffles, by using silencers and machine enclosures, by remodeling with acoustical absorbing materials, and by providing isolation in control booths. Employees who are still exposed above the action level are given hearing protection devices, and annual screening audiograms to make sure all these protections are working.

As an employer, you might encounter an exposure with which you are less familiar, such as to one of the chemicals in OSHA 29 CFR 1910 (Subpart Z). Design surveillance for these hazards using the same principles as you do in hearing conservation. As an example, let's take methylenedianiline (MDA), used as a curing chemical in plastic resins. First, identify where it is used and who is exposed. Take environmental samples to learn levels. Reduce those levels to the extent possible through engineering controls. Consider substitute chemicals or processes. Protect employees from exposure by isolation and containment. Transfer MDA with closed, "no touch" methods to prevent spilling or dispersion. If employees are still exposed above the action level, provide personal protective devices, such as gloves, Tyvec suits, and respirators. Finally, give these exposed employees periodic medical exams and testing.

If you were one of those employees, think of the reassurance you would have from periodic testing for an exposure biomarker. MDA is a chemical that can be measured in urine samples in exposed workers. In a properly designed worksite safety program, these surveillance tests should show zero levels of MDA in the urine of exposed workers. Such workers welcome that reassurance. If levels are increased, this signals a need to re-examine the entire safety process, top to bottom. And it strengthens the employees' resolve to use personal protective equipment to their best advantage.

On the other hand, consider how a worker feels who has been exposed to this seemingly innocuous substance, which in reality is a known cause of bladder cancer. Waiting for blood to appear in the urine or some other signal of bladder cancer fails to protect employees in that situation. They need a well-designed, bona fide medical surveillance program, directed "upstream" through the use of biomarkers, integrated with industrial hygiene measurements of exposure levels in the work environment in a systematic process that shares results with them. It's the right thing to do, and that's the right way to get it done.