Role of Medical Screening in the Prevention of Occupational Disease

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Some occupational medical screening programs are designed to detect adverse health effects of workplace hazards and to complement environmental control programs. Often, programs are developed using the approach of clinical practice, and procedures are not adequately standardized. The logic that guides this decisionmaking is not well developed, thus limiting the ability of occupational health practitioners to make defensible decisions regarding the management of individual workers at risk. Although the programs are, in theory, constructed to benefit the worker, little thought has been given to standardization of data collection and to using the medical information that is obtained. Currently, the National Institute for Occupational Safety and Health (NIOSH) is developing recommendations to present to the Occupational Safety and Health Administration to be used in the development of a "generic approach" to screening. These recommendations will include guidelines for threshold exposure levels for screening, rosters of screenable health effects to be targeted, algorithms linking exposure and effects, criteria for test result evaluation, plans for courses of action after testing, and procedures to ensure confidentiality. NIOSH's comprehensive approach to developing occupational screening programs should benefit employees, employers, the scientific community, and the community at large.

"Screening and monitoring, in and of themselves, prevent nothing; only the appropriate intervention, in response to results of these tests, can prevent."[1]

The most effective control of occupational disease is accomplished by curtailing environmental exposures to health hazards (ie, primary prevention). Medical screening programs often are used to complement environmental control measures. Screening programs can address the limitations of primary approaches to disease control, but should be designed to complement primary prevention efforts, not to substitute for them.

A well-designed medical screening program should benefit both the individual worker, through early disease detection, and the group of workers who share common exposures and risks. People benefit when early detection followed by appropriate intervention results in reversibility of dysfunction or the slowing or halting of disease progression. Group benefit occurs when data collected using standardized methods are grouped by exposure or job categories for analysis, and that analysis adds to understanding the exposure-disease link and how it might be broken. (Often, grouped analyses are not performed because data were not collected systematically or because this important data use was overlooked.) Such analyses can be used to evaluate the efficacy of workplace control efforts and to target future activities to prevent exposure and, thereby, control disease.

Screening for bladder cancer should follow the general principles noted above for all screening programs. Protocols to standardize the testing process and a decision logic to ensure sound medical decisionmaking should be developed and used. The decision logic should describe (1) the criteria used to determine who will be tested, (2) the basis for determining that a test is positive or borderline, and (3) the approach to management of persons with positive or borderline test findings. Procedures for ensuring confidentiality and informed consent should be developed before testing begins with the involvement of workers who will be tested.

Screening programs typically use tests developed for use in medical practice. In medical practice, diagnostic tests are used to supplement a person's medical history to provide the basis for making a cinical management decision. Such persons, usually referred to as "patients," are willing to submit to unpleasant or even hazardous

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tests because they anticipate a benefit (eg, relief from the symptoms that prompted them to seek clinical help) from the treatment that will follow.

In contrast, workers often see little potential benefit—immediate or long-range—from testing and are asymptomatic. As a result, they may be reluctant to be tested. Because workers are often quite healthy, positive test result rates will be very low, and there will be very few instances in which clear clinically evident benefit to the worker occurs.

In workplace screening programs, as well as in the community, screening is often a primary means of targeting for subsequent action. The occurrence of a positive test result presents different issues for the employer and employee. If the condition is work-related and could have been caused by an exposure, its occurrence may indicate failure of the employer's responsibility to control a workplace hazard. Thus, the screening program may target a work area or work process requiring further attention by the employer. In addition to targeting a suspect work process, the worker testing positive is also targeted, but in a different way. Frequently, the worker who has a positive test result may be concerned that the finding will affect his or her job security: workers may be transferred to less desirable positions or even terminated. Thus workers may see considerable risk from participation in screening.

Proposed National Standards for Screening Programs

Recently the Occupational Safety and Health Administration (OSHA) issued an advance notice of proposed rulemaking for a generic standard for medical surveillance. In response, the National Institute for Occupational Safety and Health (NIOSH) expressed support for their concept of a generic approach to the development of specific recommendations for medical screening programs.[2] NIOSH is currently developing comprehensive guidelines for transmission to OSHA. These will include a decision logic that can guide medical screening programs, standardized protocols for evaluating certain "screenable health effects," and policy recommendations on generic issues, such as confidentiality.

In developing the decision logic, several key questions must be answered. First, what should be the threshold exposure level for participation in a screening program? The answer must consider the intensity, duration, and route of exposure to the substance of interest. Second, for a given chemical exposure, which "screenable health effects" should be targeted for screening? A "screenable health effect" is defined as a disease or organ system dysfunction for which early detection is beneficial to the person, for which a safe, acceptable, valid, and reliable test is widely available, and which can be detected before the individual would normally seek medical care. NIOSH is currently developing a list of screenable health effects.

Once a list of screenable health effects exists, a decision rule will be developed to link a specific substance with health effects caused by overexposure to that substance. The rule will consist of criteria that specify the level of scientific evidence necessary to conclude that a specific health effect has been associated convincingly with overexposure to the substance.

Standard protocols for each screenable health effect will specify the screening test(s) to be used (including questionnaire items as appropriate), procedures for test administration, and requirements for training and certification of those performing and interpreting the test. Criteria for considering a test "abnormal" or "requiring further action" will be indicated, and recommended courses of action will be listed.

Finally, NIOSH will develop a policy position on certain generic issues such as procedures to ensure confidentiality. Furthermore, a process will be described by which grouped data can be used to evaluate the efficiency of certain workplace control programs and of the screening program itself.[3] These positions will apply to the conduct of all workplace screening programs.

Although complex and difficult to develop, this comprehensive approach to screening should benefit everyone involved in occupational safety and health. Employees will benefit because programs will be scientifically based and provide screening recommendations for many substances for which no guidance currently exists. As a result, employees may experience better health through early detection of conditions that are potentially reversible and through improved control of workplace hazards. Employers will benefit from the detailed protocols for the more efficient conduct of screening programs that can be used to direct medical practitioners, and because unnecessary and unjustifiable screening tests will be eliminated. The scientific community will benefit from the knowledge gained by analyzing data generated by large numbers of comparable screening programs. The community at large will benefit from the detection and prevention of disease. As a result, the challenging task of prevention of occupational illness and injury can be advanced.

References

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