

Genetic Screening in the Workplace

*Paul Brandt-Rauf, MD, ScD, DrPH, Jonathan Borak, MD,
and David C. Deubner, MD, ACOEM Task Force on Genetic Screening*

The mapping and sequencing of the human genome has resulted in an explosion of information, which has led in several instances to improved capability for detecting diseases or increased susceptibility to disease, treatment of diseases, and the identification of individuals at increased risk for adverse reactions to pharmaceuticals and environmental or workplace chemicals. Some genetic tests are already commercially available, for example, tests which screen for variations in genes that metabolize certain pharmaceuticals and others that identify individuals at increased risks of specific types of cancer. Genetic screening* offers the prospect of a new era for prevention and treatment and a growing array of effective new interventions.^{1,2}

Genetic screening has also been accompanied by some misunderstanding, mistrust, and fear that it could be used inappropriately. Indeed, certain previous uses of genetic screening have been inconsistent with good ethical standards and sound scientific practice and have led some to advocate that genetic screening be treated as a separate category with special safeguards. Passage of the Genetic Information Nondiscrimination Act (GINA) of 2008 formalized many of these concerns, thereby establishing strict restrictions and guidelines for the use of such testing in occupational settings.^{3,4,5}

Historically, the American College of Occupational and Environmental Medicine (ACOEM) has taken the position that genetic screening was not conceptually different from other types of medical testing or screening and that adherence to existing ethical standards, good scientific practices, and laws regulating medical confidentiality protected the rights of the individual appropriately, while allowing the new information to be used to further safeguard the health of individuals in the workplace and elsewhere. From a scientific perspective, ACOEM still regards genetic screening as conceptually similar to

other types of medical screening. Nevertheless, from a legal perspective, ACOEM recognizes that many of the potential uses of genetic screening for workplace safety programs are now legally prohibited in numerous jurisdictions. Genetic screening may be offered only on a voluntary basis, and test results may not be used to determine work practices or conditions of employment.

It is imperative that practitioners of occupational and environmental medicine be well grounded in the relevant ethical, legal, social, and scientific considerations and be prepared to offer sound advice to employees, employers, insurance companies, and regulatory agencies. For example, GINA permits voluntary testing (“genetic monitoring”) that provides information about the biological effects of toxic substances in the workplace. Similarly, GINA permits voluntary testing for genetic information in otherwise appropriate research programs, so long as the resulting genetic information is not used in a manner that impacts the tested individual’s conditions of employment.

Although the application of genetic screening in the workplace has been limited to date (and is now severely restricted), the ethical considerations of such testing in the workplace (and elsewhere) have been extensively examined. ACOEM endorses the following guiding principles:

- Genetic screening must be conducted with consideration of the law, medical ethical standards, and good scientific practices.
- Until extensively validated, genetic screening is a form of human investigation and subject to the appropriate ethical and scientific controls.
- Due consideration should be given to the quality and reliability of the screening tests and the predictive value of the results.
- Caution should be exercised in the use and interpretation of screening tests.
- If performed, genetic screening should always be accompanied by an opportunity to discuss the meaning of the results with an appropriately trained health professional.

When consulted by employees about decisions to have genetic testing performed (or seeking explanations of results performed apart from the workplace), occupational physicians should candidly share, in line with these principles, the limitations of testing and the uncertainties regarding interpretation of results.

ACOEM also notes that GINA may complicate ethical considerations for occupational physicians and others committed to the health and safety of workers and workplaces. It seems reasonable to expect that, in the future, some forms of genetic testing will provide a basis for more effective methods to ensure the health of individual workers, but that preventive actions taken on the basis of such testing might violate GINA. In such situations, both *acting* on the basis of genetic information to better protect the worker and *not acting* on that information, and thereby failing to protect the worker, would violate standards of ethical conduct. ACOEM hopes that such potential conflicts can be preemptively resolved without recourse to litigation and the federal court system.

ACOEM is the preeminent medical organization that champions the health and safety of workers, workplaces, and environments. The College represents nearly 4500 physicians and other allied health professionals who are specialists in the field of occupational and environmental medicine.

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Address correspondence to: Marianne Dreger, MA, ACOEM (info@acoem.org).

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*In the following discussion, the term “genetic screening” and “genetic testing” refer to the evaluation of genotype (ie, tests that specifically characterize gene or chromosomal structure), not tests that characterize phenotype or evaluate function.

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