



Accommodating the Allergic Employee in the Workplace

Defining the Allergic Employee

An allergy is an overreaction of the immune system to food, dust, pollen, or some other substance. The function of the immune system is to recognize and eliminate agents that are harmful to the host. When the immune system is functioning properly, the foreign agents are eliminated quickly and efficiently. Occasionally, the immune system responds adversely to environmental agents, resulting in an allergic reaction. When the immune system overreacts, the response is out of proportion to, and more harmful than, the initial threat of the environmental agent.

Hypersensitivity, or allergy, is not due to an alteration of the immune system by a foreign substance, but is an inappropriate activation of the immune system. In other words, an allergy is a normal immune response with deleterious consequences, such as allergic rhinitis, hay fever, or contact sensitivity. In some of these cases, the response can be the source of tissue damage, so that suppressing certain immune reactions actually reduces tissue injury. Once sensitized, the affected individual becomes more sensitive to lower concentrations.

This brochure will not discuss all of the various types of allergic reactions an individual might have, but several deserve mention. One type occurs when antibodies bind to the environmental agent (antigen) that has been taken into the body or makes contact with the skin or mucous membranes. The binding reaction causes chemicals from the body to be released, producing dilation of the blood vessels and the release of fluid causing swelling and inflammation. The

main targets of this type of reaction are: the skin, producing urticaria (hives) and atopic dermatitis (rash); the respiratory system, producing rhinitis (inflamed nasal passages) and asthma; the vasculature, causing anaphylactic shock; and the gastrointestinal tract, causing food allergies. These responses are called immediate hypersensitivity because they usually occur quickly after reexposure to an antigen to which the individual has been sensitized. Another type of allergic reaction, called delayed hypersensitivity, does not involve antibodies, but produces an inflammatory reaction by the action of specialized types of white blood cells. The target for this type of reaction can be almost any organ, but the classic example is the skin, as in the case of contact dermatitis.

Anaphylactic shock is a dangerous allergic condition in which a reaction takes place all through the body immediately after an antigen to which the person is sensitive has entered the circulatory system. The reaction causes the release of body chemicals that make the arteries and veins dilate, greatly reducing blood pressure in the arteries, and also causes a rapid loss of fluid from the blood and into the tissue spaces. The resulting shock can produce death within minutes.

Allergies to Workplace Exposures

Hypersensitivity from environmental exposures in the workplace can produce respiratory disorders, skin disorders, or anaphylactic shock. Numerous inhalants cause immune-mediated respiratory disorders, including some types of bronchial asthma, hypersensitivity pneumonitis, allergic rhinitis, and broncho-pulmonary aspergillosis. Immune system involvement has also been seen for silicosis, asbestosis, coal workers' pneumoconiosis, and possibly byssinosis. Allergic reactions of the skin include allergic contact dermatitis (red rashes, swelling, itching, and sometimes blisters).

Although almost anyone can develop an allergy to a given substance, a distinct segment (15 - 20 percent) of the population is clinically atopic (unusually reactive to a variety of substances). Some individuals could have genetic differences that predispose them to allergies to certain environmental and occupational antigens. Generally, however, the individual who develops occupational asthma is non-atopic (not unusually reactive) and may experience a delayed allergic response in the evening or at night. Characteristically, the individual develops the symptoms of asthma, which include wheezing, shortness of breath, cough, and chest tightness. The symptoms improve away from work, but worsen upon return to work.

Identifying the Sensitizer in the Work Environment

There is an enormous range of potential allergens in the workplace. Documented case histories involve a large number of substances, even though the numbers of people affected by any one substance may be very small. Below are listed some occupational exposures that have been documented as producing allergic reactions. Additional information is available on the allergens that have been shown to be related to specific occupations or exposures.

Some common chemicals associated with occupational asthma include:

- Platinum salts
- Nickel salts
- Diisocyanates (such as toluene diisocyanate or TDI)
- Ethylenediamine
- Phthalic anhydrides
- Sodium and potassium persulfates (textile and hair bleaches)

Some common occupational exposures associated with allergy include biological agents – either living organisms, dead organisms, or chemicals extracted/derived from plants or animals:

- Pyrethrum (from chrysanthemum flowers; used as the bases of some insecticides)
- Colophony resins (derived from pine resin)
- Fungi (molds): many genera of fungi can produce allergy including both immediate-type allergic reactions such as asthma or hay fever (sometimes accompanied by fungal colonization of mucous secretions) and hypersensitivity pneumonitis. Common fungal allergens associated with moisture problems in buildings or with occupations in agriculture, composting, food handling, and food processing include *Aspergillus*, *Penicillium*, and *Cladosporium* species.
- Protease enzymes: derived from *Bacillus subtilis*, used in laundry detergents
- Henna
- arthropod bites and stings: such as bees and wasps
- animal dander, or other proteinaceous byproducts or debris (e.g. book mite excrement)
- natural glues
- protein additives: such as purified/extracted protein from feathers used in hair conditioners
- animal fat, oil, and other products
- celery pickers' dermatitis (photoallergy)
- wood allergies: Western Red Cedar, oak, maple bark, mahogany, pine (dusts, resins)
- latex allergy from natural rubber
- baker's asthma (flour); grain dusts and grain products; natural glues
- perfumes and odorants (such as orris root)
- vegetable gums (inc. acacia)
- papain

- tobacco dust
- flax seed, castor bean, soybean, coffee beans
- yeasts

Some common contact sensitizers of the skin include:

Poison ivy	European primrose
Benzocaine	Epoxy Resins
Mercaptan	Picric acid derivatives
Ethylenediamine	Formaldehyde
Thimerosal	Beryllium
Nickel	Cadmium
Chromium	Chromates
Silver	Zirconium
Latex	Metalworking fluids
Quaternary ammonium compounds used as disinfectants, fabric softeners, and wood preservatives	
Paraphenylenediamine	
Carbon-iodine hydrocarbon compounds	

Occupational Exposure Limits and the Sensitive Worker

It would be most helpful in solving a workplace exposure problem if the specific allergen could be identified and the nature and extent of the exposure documented so that it could be addressed or reduced. Immunotoxicologists have identified many substances that have demonstrable immuno-toxic effects in laboratory animals and, in a few instances, the effects of these substances have been observed in humans as well. Occupational experience has provided some evidence of substances' effects in humans. For the most part, however, data are sparse on the effects of general exposure to immunotoxicants in the environment, although the scientific community does recognize that the immune system is an important target organ for toxicity.

Several federal activities are designed to enhance public awareness of the hazards of toxic substances. The Occupational Health and Safety Administration (OSHA)'s Hazard Communication Standard (29 CFR 1910.1200) and Laboratory Standard (29 CFR 1910.1450) require that workers be provided with information about the known health hazards of their jobs. Since so little information is available regarding immunotoxic effects, however, the Standards do little at present to protect workers from potential allergens.

Only a few chemicals are presently regulated by OSHA for which potential sensitization is an adverse health effect specifically considered by the regulation:

- Cobalt metal, dust, and fume (Respiratory System)
- Formaldehyde (Skin and Respiratory System) (29 CFR 1910.1048)
- Isophorone Diisocyanate (Skin and Respiratory System)
- Phenyl Glycidyl Ether (Skin)
- Picric Acid (Skin)
- Toluene-2,4-Diisocyanate (Respiratory System)

While some potential sensitizers are regulated in the air contaminants standard (29 CFR 1910.1000), they are not regulated for the purpose of preventing allergy. Also, the regulatory limits set for their concentrations in the air are probably not low enough to prevent allergic reactions, especially in persons with occupational asthma.

Most scientists agree that the lack of human test data should not stop efforts to control human exposures to suspected sensitizers, but the absence of data ensures continued disagreement about suitable means and levels of control. In regulating exposure to potential allergens, the nature of the dose is significant:

to prevent adverse health effects, should the exposure be considered over an 8-hour work shift, as one larger dose, or as an intermittent high dose? Some information indicates that perhaps high intermittent doses can result in sensitization or can affect individuals who are sensitive. There is evidence to indicate even a one-time exposure can produce sensitization. A problem with setting exposure limits for an immune system-related response is the challenge of developing an acceptable exposure limit for an event that does not appear to fit the standard dose-response relationship.

Accommodating the Allergic Employee

Once an employer learns that an applicant or employee is allergic to a substance in the workplace, the employer will be required to accommodate the employee if he or she meets the definition in the Americans with Disabilities Act (ADA) of an individual with a disability. The ADA defines an individual with a disability as someone with a physical or mental impairment that substantially limits a major life activity. Major life activities include actions such as caring for oneself, walking, talking, seeing, breathing, and working. Major life activities also include major bodily functions such as the function of the immune system. In determining whether an impairment is substantially limiting, ameliorative measures such as medications are not considered. In other words, an employee who successfully controls the adverse effects of exposure to sensitizers through the use of medications could nevertheless qualify as disabled if the effects of that exposure in their unmitigated state substantially limit his or her breathing, the function of his or her immune system, or some other major life activity.

A reasonable accommodation is a modification or adjustment to a job, the work environment, or the way things usually are done that

enables a qualified individual with a disability to enjoy an equal employment opportunity. Employers are not required to provide any accommodation if it would impose an undue hardship upon that employer's business. This determination of what constitutes an undue burden can vary from one employer to the next, depending upon the size of the employer's business, its financial resources and other factors.

The allergic worker may be able to respond to low levels of exposure, levels that may be lower than the relevant occupational exposure limits set by OSHA or recommended by agencies such as the National Institute for Occupational Safety and Health (NIOSH) or organizations such as The American Conference of Governmental Industrial Hygienists (ACGIH). Accommodating the allergic employee would therefore generally involve reducing exposure by providing specific protection for the sensitive individual, such as additional protective equipment the average (non-allergic) worker probably would not need. Protective equipment could involve the use of respirators for respiratory protection or protective clothing (such as gloves) or barrier creams for skin protection. The use of respirators would involve employer compliance with OSHA's Respiratory Protection Standard (29 CFR 1910.134), including determining whether a worker could wear a respirator.

Powered air-purifying respirators (PAPRs) are battery-powered respirators which may enable those with pulmonary or cardiovascular problems to still use a respirator. Respirators made of silicone may enable someone to wear a respirator who has a rubber allergy. Exposure could be reduced by the use of engineering controls such as better or more efficient use of ventilation to dilute or remove exposure; improved equipment design to reduce the production of vapors, mists, and splashes; or enclosures of equipment or pro-

cesses to contain or collect any emissions. Air cleaning equipment could be used to reduce the air concentration of a potential allergen in the work area of a sensitive individual. Exposure may be reduced by scheduling changes that do not place the sensitive worker in a work area at the same time that a potential allergen is being used. For example, avoiding the use of products such as cleaning chemicals or pesticides or paints in the sensitive person's office or work area.

Accommodation includes having personnel aware of what to do or who to call (such as emergency telephone numbers) if the allergic person experiences an adverse reaction such as an asthmatic attack or anaphylactic shock. The allergic person's physician can likely recommend appropriate measures (such as having antihistamines or bronchodilators available for emergency use).

There are, however, some other alternatives to consider that could reduce or altogether remove the potential for exposure to an allergen, including product or process substitution. Product substitution involves the use of an alternative formulation for the chemical or material being used in order to eliminate or reduce the potential allergen. For example, to avoid asthma from inhalation of persulfate boosters in hair bleaches, a hairdresser could use bleach with a non-persulfate booster such as sodium perborate, sodium percarbonate, or magnesium carbonate. In process substitution, the employer adopts a method of performing a task that reduces or eliminates exposure to the allergen. For example, an employer may choose to sterilize materials by using steam or ultraviolet light rather than a formaldehyde solution and thereby reduce or eliminate skin or respiratory allergies. Both product and process substitution may present additional advantages to the employer in the areas of cost savings on hazardous waste disposal, less potential liability for handling or storage of

hazardous materials, reduced need for extra or special ventilation or protective equipment/clothing, reduced needs for fire or other types of insurance, and reduced workers' compensation costs for injuries or illnesses. Moreover, substitutions may have the added advantage of reducing exposure for other workers who have not yet shown any adverse health effects.

For some chemical exposures, it may be possible to have medical testing to determine if an individual is likely to have an allergic reaction to an exposure or to diagnose hyper-reactive respiratory airways. To assure compliance with the ADA and to protect the individual's privacy, it is important that such testing be performed only after the employer has made a job offer and that it be performed by a physician who reports to the employer only the information as to whether the employee can perform the requirements of the job and what accommodations might be necessary to enable him/her to do so.

Accommodating an allergic employee should involve understanding the individual's experience of the nature and severity of his/her condition by considering the following aspects of the allergy:

- What is the severity of the harm: for example, would this be a fatal asthmatic reaction or a nonspecific asthma with short-term reversible symptoms? What is the employee doing and where, if the harm occurs? For example, is this a clerical worker near good medical facilities or an on-duty police officer, firefighter, or airline pilot?
- What is the likelihood of the allergic event: exclusion from the job may be justified if the event has a high probability of occurring; this depends entirely on methods of workplace hazard control, rather than on the clinical state of the allergic worker.

- What is the imminence or time course of the event, especially if it is likely to occur in the near future; for example, a severe asthma attack is generally more imminent than development of a bronchogenic carcinoma?
- What is the duration of the personal risk for a worker with asthma, when the severity of the illness is temporary?

With this approach, accommodation can be done using good information and judgement, without "protecting" the employee out of a job.

Resources

For information on the Americans with Disabilities Act and accommodations the following can be contacted:

ADA Regional Disability and Business Technical Assistance Center Hotline, 800.949.4232 (voice/TTY)

Job Accommodation Network, 918 Chestnut Ridge Road, Suite 1, Morgantown, WV 26506-6080, (800) ADA-WORK (voice/TDD) <http://www.jan.wvu.edu/>

American Conference of Governmental Industrial Hygienists (ACGIH) 1330 Kemper Meadow Drive Cincinnati, Ohio 45240, USA Customers/Members Phone: 513.742.2020 Administrative Phone: 513.742.6163 Fax: 513.742.3355 E-mail: mail@acgih.org <http://www.acgih.org/>

Workplace Health and Safety Program, Cornell University, School of Industrial and Labor Relations, 237 Main St. – Suite 1200, Buffalo, NY 14203 716.852.4191

Equal Employment Opportunity Commission,
131 M Street, NE, Washington, DC 20507,
800.669.4000 (voice), 800.669.6820 (TTY), or
800.669.3362 (publications), 800.669.3302 (TTY)

The Equal Employment Opportunity Commission has issued enforcement guidance which provides additional clarification of various elements of the Title I provisions under the ADA. Copies of the guidance documents are available for viewing and downloading from the EEOC web site at:

<http://www.eeoc.gov>

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The U.S. Equal Employment Opportunity Commission has reviewed it for accuracy. However, opinions about the Americans with Disabilities Act (ADA) expressed in this material are those of the author, and do not necessarily reflect the viewpoint of the Commission or the publisher. EEOC interpretations of the ADA are reflected in its ADA regulations (29 CFR Part 1630), Technical Assistance Manual for Title I of the Act, and Enforcement Guidance.

Cornell University is authorized by NIDRR to provide information, materials, and technical assistance to individuals and entities that are covered by the Americans with Disabilities Act (ADA). You should be aware that NIDRR is not responsible for enforcement of the ADA. The information, materials, and/or technical assistance are intended solely as informal guidance, and are neither a determination of your legal rights or responsibilities under the Act, nor binding on any agency with enforcement responsibility under the ADA.

About this Brochure

This brochure is one of a series on human resources practices and workplace accommodations for persons with disabilities edited by Susanne M. Bruyère, Ph.D., CRC, Director, Employment and Disability Institute, Cornell University ILR School.

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The full text of this brochure, and others in this series, can be found at www.hrtips.org.

More information on accessibility and accommodation is available from the ADA National Network at 800.949.4232 (voice/ TTY), www.adata.org.

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