

Chapter 2

The Occupational and Environmental History

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Abstract The occupational and environmental history is fundamentally important to making the correct and timely diagnosis of any illness that may have resulted from a toxic exposure in the workplace, the household, or the general environment. In interviewing the patient with a potential occupational or occupational illness, it is important for the physician to ask questions that efficiently lead the patient into providing useful information about possible associations between the presenting illness and potential toxic exposures. A particularly useful and efficient construct for interviewing a patient about his or her occupational and environmental history is contained in the easy-to-remember mnemonic “WHACOS.” The components of the “WHACOS” mnemonic are as follows:

W—What do you do? *H*—How do you do it? *A*—Are the symptoms *acute or chronic* in nature? *C*—Are any *coworkers, family members, or friends* sick with the same illness? *O*—Do you have any hobbies, pets, or travel *outside* of work? *S*—Are you *satisfied* with your job? These simple questions can efficiently lead the patient into a useful dialog with the physician about occupational and environmental factors that can provide important clues about the etiology of an illness that may be related to a toxic exposure.

Keywords Occupation • Environment • Work • Hobbies • Interview • History

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Introduction

There are a wide variety of respiratory disorders that can result from the inhalation of toxic gases, fumes, particles, and dust. These disorders can occur from toxic inhalational exposures in the workplace, the household, and the general environment. They include asthma, reactive airways dysfunction syndrome, pneumoconioses, hypersensitivity pneumonitis, acute inhalational lung injury, chronic cough, benign pleural disease, mesothelioma, lung cancer, and respiratory infections, such as tuberculosis. In some cases, the root cause of an occupational or environmental respiratory disease is readily apparent. In other cases, the root cause may be elusive and difficult to establish.

The occupational and environmental history is fundamentally important to making the correct and timely diagnosis of any illness that may have resulted from a toxic exposure in the workplace, the household, or the general environment. The aim of the occupational and environmental history is to establish an association between the illness and toxic agents to which an individual may have been exposed, as well as to make an assessment of the extent and time course of the potential toxic exposure. The occupational and environmental history is especially important in the evaluation of the patient with a respiratory disorder that may be related to a toxic inhalation.

Occupational and Environmental Exposure History Forms

A number of standardized forms for compiling a detailed and extensive occupational and environmental exposure history have been published. These forms are readily available in print form and online. These forms allow the patient to provide responses related to the past medical history, drug use, family history, social history, employment history, the workplace environment, the home environment, smoking history, travel history, military service, allergies, and potential toxic exposures. These forms, if properly completed, can provide the physician with valuable background information that becomes an important part of the medical record and can, possibly, provide important clues about possible occupational or environmental causes of the patient's illness. An example of a comprehensive occupational and environmental exposure history form is included in the Appendix to this chapter [1].

Standardized forms, while generally useful, have some limitations. First of all they contain a lot of information that may or may not be useful with respect to the specific problem that the patient presents. Secondly, the responses of the patient may not be entirely accurate or complete. Patients may sometimes misunderstand the nature of some questions on the form and may provide erroneous or irrelevant information. Some patients may also list toxic substances that they think they may have been exposed to when, in fact, they have not been exposed to these toxic substances at all. This can be misleading and potentially confusing to the physician. Thirdly, the patient responses on these forms, while providing a lot of information, do not

make associations between the presenting illness and potential toxic exposures, nor do they make associations between the time course of the presenting illness and the time of potential toxic exposures. Only by the careful interviewing of the patient can the physician begin to make these important associations. Thus, standardized occupational and environmental history forms can best be used to provide background information that can help the physician focus on specific areas during an interview of the patient.

The Patient Interview

In interviewing the patient with a potential occupational or occupational illness, it is important for the physician to ask questions that efficiently lead the patient into providing useful information about possible associations between the presenting illness and potential toxic exposures. This, in turn, can provide the physician with important clues about potential occupational and environmental etiologies of the presenting illness. They can also guide the physician in ordering the most appropriate diagnostic studies for further evaluation of the illness.

A particularly useful and efficient construct for interviewing a patient about his or her occupational and environmental history is contained in the easy-to-remember mnemonic “WHACOS.” This construct contains a series of easy-to-understand, open-ended questions that lead the patient into describing and discussing key points about his or her occupational and environmental history [2, 3]. The components of the “WHACOS” mnemonic are as follows:

W: What do you do?

H: How do you do it?

A: Are the symptoms acute or chronic in nature?

C: Are any coworkers, family members, or friends sick with the same illness?

O: Do you have any hobbies, pets, or travel outside of work?

S: Are you satisfied with your job?

These simple questions can efficiently lead the patient into a useful dialog with the physician about occupational and environmental factors that can provide important clues about the etiology of an illness that may be related to a toxic exposure. Each component of the “WHACOS” construct will be discussed in the sections that follow.

What Do You Do?

The job title or the job description oftentimes does not provide an accurate or complete understanding of what the patient actually does at work. In this regard, a job title or job description alone may not facilitate the making of associations that point to an

occupational or environmental etiology of a respiratory illness. Asking a question such as “what is your occupation” or “what is your job” generally has little value. For example, the fact that a patient is a “construction worker” does not tell the physician exactly what the patient does. “I mix and pour cement at construction sites” provides much more useful information. Similarly, a patient who tells you that he is a “foundry worker” provides little information in comparison to a statement such as “I mix and pour green sand into molds then pour molten bronze into the molds to make bronze castings.” Thus, by simply asking “what do you do?” the physician can get a very good idea of what the patient may be exposed to in the workplace. Careful follow-up questions can provide more detailed information in this regard.

How Do You Do It?

After the patient tells you exactly what he or she does, it is useful to ask “how do you do it?” This can provide the physician with important information about the processes that the patient uses at work and whether or not the patient uses respiratory protection while engaged in these processes. For example, I was once asked to see a hospitalized patient with alcoholic liver disease who also had significant hypoxemia and diffuse, dense, bilateral fibrotic infiltrates on a CT scan of the chest. At the time of admission no one had taken an occupational and environmental history. Upon asking the patient “what do you do?” he told me that he sandblasted the inside of empty liquid storage tanks in order to clean the inside walls of the tanks. I then asked the patient “how do you do it?” He told me that he was lowered into the tanks with a rope and harness and that he sandblasted the inside walls of the tanks while suspended by the rope. Upon further questioning he told me that he had been doing this for 24 years, that each sandblasting operation inside the tanks took 4–5 h, that it was difficult to see what he was doing because it was dark inside the tanks, and that he never used respiratory protection because it was “too hot” inside the tanks. Upon correlating the patient’s responses to “how do you do it?” with the chest CT scan findings, the diagnosis was readily apparent. The patient had progressive massive fibrosis from the inhalation of large quantities of silica dust over a period of 24 years. On further evaluation the patient also had *Mycobacterium avium complex* lung infection, which occurs with increased frequency in individuals with silicosis. This is a good example of how the simple question “how do you do it?” can quickly lead the physician to the correct diagnosis of an occupational or environmental lung disease.

Are the Symptoms Acute or Chronic in Nature?

The rapidity of onset and the time course of a respiratory illness can provide the physician with important clues about the differential diagnosis of the presenting

symptoms, as well as a temporal association between the onset of the illness and potential occupational or environmental exposures.

Illnesses that are acute in onset should guide the physician to consider disorders that can occur shortly after exposures to potentially toxic substances at work, at home, or in the general environment. These include workplace-related asthma, acute inhalational injury, and acute hypersensitivity pneumonitis. Such disorders may result from exposures related to a new job, a change in the workplace environment, the use of a new substance at work or at home, exposures related to new pets or hobbies, or proximity to the acute release of a toxic substance. On the other hand, illnesses that have a chronic or progressive course should suggest disorders that are related to chronic, persistent exposures in the workplace, home, or general environment. These include pneumoconioses, subacute and chronic hypersensitivity pneumonitis, asbestosis, chronic bronchitis, bronchiolitis obliterans, chronic beryllium disease, hard metal lung disease, and tuberculosis. Such disorders may result from the chronic exposure to mineral dusts, organic dusts, molds, microorganisms, asbestos, toxic fumes, or metal dusts. Thus, whether the presenting symptoms are acute or chronic in nature, can be of tremendous help in formulating the differential diagnosis and eventually making the correct diagnosis.

The temporal association between the onset of symptoms and potential occupational or environmental exposures can also be very helpful in making the correct diagnosis. For example, a patient who develops symptoms of asthma during work days, but does not experience these symptoms when away from work, may have occupational asthma. Similarly, a farmer who typically develops dyspnea and a viral-like illness during certain times of the year, such as the time of the year when hay is baled and stored, may have acute hypersensitivity pneumonitis. Therefore, it is important for the physician to establish any temporal relationship between the onset of symptoms and specific activities at work or home, if an occupational or environmental illness is suspected.

Are Any Coworkers, Family Members, or Friends Sick with the Same Illness?

It is very important for the physician to ask the patient about the occurrence of the same illness among coworkers, family members, or friends if an occupational or environmental illness is suspected. If the patient has coworkers who have similar symptoms, the probability of a workplace-related illness is increased. Similarly, if family members have similar symptoms, an illness related to a toxic exposure in the home environment should be suspected. If the patient has friends with similar symptoms, the physician should ask about activities that the patient and affected friends have engaged in together. Thus, similar symptoms among coworkers, family members, or friends can provide important clues about where a toxic exposure may have occurred. The physician can then initiate an appropriate industrial hygiene

assessment, household exposure assessment, or environmental exposure assessment in order to detect and characterize any toxic substance that could be the root cause of the common illnesses.

Do You Have Any Hobbies, Pets, or Travel Outside of Work?

Activities outside of work may also be the source of toxic exposures that can cause an environmentally related illness. Hobbies may involve the use of potentially toxic substances such as paints, glues, organic solvents, wood dust, metal dust, mineral dust, organic dust, colophony, fertilizers, pesticides, or toxic fumes, all of which have the potential to cause a respiratory illness following acute or chronic exposure. Therefore, it is important for the physician to obtain detailed information about any current or past hobbies of the patient.

Pets can be an especially important source of toxic environmental exposures. The dander of common household pets such as dogs and cats can be a cause of asthma. The urine and feces of household pets can be allergenic, as well as a source of infection. Bird dander is a particularly important cause of hypersensitivity pneumonitis among bird fanciers and pigeon breeders. The physician should specifically ask about exposure to birds when evaluating any patient that is suspected of having acute, subacute, or chronic hypersensitivity pneumonitis. Animal bites and scratches can also be a cause of infections, such as cat-scratch fever, leptospirosis, toxoplasmosis, and rabies. Therefore, asking a patient about pets, as well as any temporal relationship between exposure to pets and the onset of symptoms, is an important part of the occupational and environmental history.

The patient's travel history is also an important part of the occupational and environmental history. Temporal relationships between travel and the onset of symptoms may provide important clues about the etiology of a suspected environmentally related illness. Information about the dates of travel, the travel destination, the length of stay at the destination, activities at the destination, and the means of transportation should be sought by the physician. Known environmental problems at the destination, such as severe air pollution, known water pollution, or toxic releases from industrial plants can then be investigated by the physician. Infections, such as malaria, typhoid fever, yellow fever, coccidioidomycosis, histoplasmosis, giardiasis, and tuberculosis are typically endemic to certain geographical areas. Travel to tropical areas can result in exposure to vegetation, molds, and microorganisms that can trigger asthma or acute hypersensitivity pneumonitis. It is possible that symptoms of a travel-related illness may not occur until after the patient has returned to home and work. This is especially true of travel-related infections. Thus, it is possible for travel-related illnesses to be mistaken for illnesses related to the workplace or home environment. A careful travel history is important in helping to make this distinction.

It is not uncommon for patients to be referred for the evaluation of potential workplace-related illnesses that are, in fact, related to hobbies, pets, or travel. Failure

to ask about activities outside of work may result in an inappropriate, unproductive, time-consuming, frustrating, and expensive medical evaluation that could be avoided by asking the simple question: “Do you have any hobbies, pets, or travel outside of work?”

Are You Satisfied with Your Job?

Occupational stress is an increasing problem in the workplace. Occupational stress can result from a number of workplace situations. Some of the most common causes of occupational stress are a lack of trust in the employer, a difficult and demanding supervisor, interpersonal conflicts with one or more coworkers, inadequate training for difficult tasks, the lack of proper equipment, frequent accidents at the worksite, unpredictable work schedules, failure to meet production quotas, poor communication regarding performance expectations, a poor performance evaluation, fear of job loss, the layoff of coworkers, a reduction in pay or benefits, a dirty or cluttered work environment, improper or inadequate ventilation, inadequate climate control, and boredom from repetitive tasks. Individuals who work with hazardous materials may experience occupational stress from this fact alone. It is also possible for personal or family problems to cause degradation in job performance, which can lead to considerable occupational stress.

It is important for the physician to realize that occupational stress can contribute to the development or exacerbation of medical problems such as hypertension, hypercholesterolemia, diabetes mellitus, metabolic syndrome, coronary artery disease, asthma, chronic obstructive pulmonary disease, depression and anxiety. Dyspnea, hyperventilation, and chest pain are common respiratory complaints of individuals suffering from occupational stress. These symptoms may be related to an underlying respiratory disorder, such as asthma or chronic obstructive pulmonary disease, which is exacerbated by occupational stress. Respiratory symptoms may also be *perceived* as being related to a respiratory illness by a patient suffering from environmental stress, even though no underlying respiratory illness actually exists. This is especially true of individuals who have depression, a generalized anxiety disorder or recurrent panic attacks. In some cases the reported respiratory symptoms may be fictitious, with the patient willfully and knowingly complaining of false symptoms in an attempt to establish a medical reason for being removed from the workplace by the employer, often with the intent of obtaining “secondary gain” through workman’s compensation or disability benefits.

In evaluating a patient for symptoms that could be related to a toxic occupational or environmental exposure, it is essential for the physician to consider the possibility that occupational stress may be a contributing factor. Distinguishing between symptoms that are related to an actual occupational or environmental illness, symptoms that are perceived to be related to an occupational or environmental illness that does not exist, or symptoms that are willfully fictitious can be extremely challenging, even for the most astute and experienced physician. The occupational and

environmental history is critical in this regard. A simple and efficient way of assessing the possibility of occupational stress is to ask the simple question, "Are you satisfied with your job?" This is a straightforward and nonthreatening way of leading the patient into a discussion about factors in the workplace that could be a source of environmental stress. If asked with an appropriate sense of empathy and concern, it can oftentimes coax the patient into informing the physician of stressful workplace or home situations that may be related to the presenting symptoms. In most cases it is both necessary and important to obtain objective evidence to establish or exclude the diagnosis of an underlying medical problem, but a strong suspicion of occupational stress or malingering can help the physician plan to most appropriate medical evaluation of the patient. In some cases, this may involve the eventual referral to a mental health professional or a social worker.

Appendix: Occupational and Environmental Exposure History

Patient Name: _____ **Medical Record Number:** _____

Date of Form Completion: _____ **Date of Birth:** _____

A. Current Occupational History

Are you currently employed?

Yes _____ No _____

If yes, what was your approximate date of hire? _____

Please fill out the following regarding your current job:

Name of Employer	Job Title	Job Description
_____	_____	_____

Describe your typical work shifts in a week (e.g. Monday 8AM-5PM, Tuesday 12noon-8PM etc.):

Monday _____

Tuesday _____

Wednesday _____

Thursday _____

Friday _____

Saturday _____

Sunday _____

Can you smell the chemicals or materials that you work with?

Yes _____ No _____

Have you ever worked in a dusty environment?

Yes _____ No _____

Have you ever worked in a moldy or musty environment?

Yes _____ No _____

Do you ever get material from work on your clothes or skin?

Yes _____ No _____

Do you wash your hands with solvents in the workplace?

Yes _____ No _____

Do your work clothes get laundered at home?

Yes _____ No _____

Do you shower regularly at work?

Yes _____ No _____

Do you use protective equipment such as gloves, masks, respirators or hearing protectors at work?

Yes _____ No _____

Have you ever been advised to use protective equipment?

Yes _____ No _____

Have you been instructed in the use of protective equipment?

Yes _____ No _____

Is there smoke at the workplace?

Yes _____ No _____

Do you smoke in the workplace?

Yes _____ No _____

Do you eat at the work place?

Yes _____ No _____

Have you ever been off work for more than 1 day because of an illness related to work?

Yes _____ No _____

Have you ever changed jobs or work assignments because of health problems or injuries?

Yes _____ No _____

Has your work routine changed recently?

Yes _____ No _____

Is the ventilation system at your workplace adequate and working properly?

Yes _____ No _____

B. Hazardous Exposures at Work or Home (circle all that apply)

Animals	Extreme Heat/Cold	Nickel
Arsenic	Fertilizers	Paints/Varnishes
Asbestos	Fumes	Pesticides
Benzene	Glues/Adhesives	Petroleum Products/Gasoline
Beryllium	Grain Dust	Phosphates
Biological Hazards	Isocyanates	Power Tools
Cadmium	Latex	Sand/Stone Dust
Chromates	Lead	Silica
Cigarette Smoke	Lifting	Smoke
Coal Dust	Loud Noise	Solvents
Cobalt	Mercury	Vanadium
Cutting Oils	Metal-Grinding Dust	Vibration
Dust	Metal-Working Fluid	Wood Dust/Saw Dust

Other: _____

Are any co-workers exposed to any of the hazardous exposures listed above?

Yes _____ No _____

Are there any co-workers with symptoms similar to those that you are experiencing?

Yes _____ No _____

Is anyone in your home exposed to any of the hazardous exposures listed above?

Yes _____ No _____

Are there any family members with symptoms similar to those that you are experiencing?

Yes _____ No _____

C. Previous Occupational History

Please fill out the following table regarding past jobs, including temporary, seasonal, part-time and military employment

Employer	Date Started/Ended	Job Title/Description	Known Hazards

D. Environmental History

Community Environment:

Do you live close to any of the following? Check all that apply.

Heavy Traffic	Industrial Plant	Power Plant
Waste Dump	Superfund Site	Construction Site

Home Environment:

In approximately what year was your house built? _____

Circle all that apply to your home.

Septic system	Central heating	Fireplace/Wood Stove
Air humidifier	Central air conditioner	Gas stove
Well water	Window air conditioner	Water leaks
City water	Gas space heater	Other: _____

Do you have a basement?

Yes _____ No _____

If yes, please answer the following questions:

Does your basement have a musty or moldy odor?

Yes _____ No _____

Does your basement have a water problem?

Yes _____ No _____

Has your basement ever flooded?

Yes _____ No _____

Is your kitchen stove exhausted to the outside from a range hood?

Yes _____ No _____

Is air from your bathroom(s) exhausted to the outside?

Yes _____ No _____

Is there mold growth on any of your bathroom walls?

Yes _____ No _____

Is there mold growth on any of your shower curtains?

Yes _____ No _____

Hobbies:

Circle all that apply.

Auto Body Repair/Restoration	Hunting	Photography
Auto Mechanics	Leather Working	Sculpture
Ceramics/Pottery	Masonry	Stone Work
Electronics	Metal Working	Taxidermy
Fishing	Model Making	Woodworking
Gardening	Painting	Other:

Do you use any solvents in any of your hobbies?

Yes _____ No _____

Do you do any soldering in any of your hobbies?

Yes _____ No _____

Do you have any pets?

Yes _____ No _____ If yes, what kind of pets? _____

Have you ever kept birds as pets?

Yes _____ No _____ If yes, what kind of bird(s)? _____

Personal Exposures:

Do you currently smoke?

Yes _____ No _____

If yes, _____ packs/day for _____ years

Is there someone else in your household that smokes?

Yes _____ No _____

If yes, _____ packs/day for _____ years

Approximately how many drinks of alcohol do you have per week?

Do you take any prescription drugs?

Yes _____ No _____

If yes, please list each drug that you take, the dose of each drug and how often you take each drug.

Do you take any herbal or vitamin supplements?

Yes _____ No _____

If yes, what do you take and how often do you take it?

Do you use recreational drugs?

Yes _____ No _____

If yes, what do you use and how often do you use it?

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