

Do You Have a Cluster?

Odds are if you are an occupational health professional, you will be asked to determine if disease or symptoms in a group of workers is due to work or the environment. Fortunately, most companies have reduced chemical exposures to levels that meet or better recommended levels. Still, workers, especially in small companies, can develop work-related illnesses. Certain remediation activities, such as refurbishing steel highway overpasses, have produced excessive lead levels and workers have complained of symptoms potentially related to lead toxicity.

The term "cluster" refers to a group of complaints or diseases with something in common, such as similar exposure or place of work. Examples of clusters include a group of individuals with cancer or complaints from individuals in an office of irritation due to poor air quality. Clusters are usually identified by individuals comparing notes and realizing "Gee, four people in our office have come down with cancer in the past three years. I wonder if it's something in the workplace."

Approaching a cluster requires management commitment as well as a solid, objective scientific approach. It is very easy to dismiss workers' complaints as the product of a few disgruntled employees. While the vast majority of "clusters" are not confirmed, it is critical not to miss real work-related adverse health effects. Moreover, with "chemicalphobia" rampant, a prompt caring response will help allay unwarranted fears and assure all parties that a real health concern does not exist.

Investigating the Cluster

Critical to cluster investigation is the proper identification and classification of the complaints. Alleged cancer clusters have consisted of many different types of cancers in workers of various ages, different employment duration and even varied past exposures. Frequently, common cancer types such as breast, lung and colon are manifested. With the exception of specific workplace exposures of a long-term, high-level nature such as for asbestos, the causes of the other cancers (and most lung cancer) are rarely work-related. Remember that one in four Americans will develop cancer during their lifetime.

Clusters are frequently just what the term means, a group of events. To qualify as a related group of events, work-related cancers should meet these scientific criteria: (1) adequate latency period, (2) pathological confirmation of the same

organ and cell type, (3) lack of recognizable alternative etiologies, and (4) demonstrated related exposure(s).

Two difficult problems often surface during the investigation. First, the number of events is usually small. Only two or three cancers, for example, may be in question. What makes them stand out is that the individuals involved may occupy a small lab or common area and to the occupants, they feel that "50 percent of our group are ill." If one applies the appropriate epidemiologic approach, the basis for the presence, or lack thereof, of the cluster and any relevance to the workplace can be determined.

Communication of the investigation process and of the results as they are developed to all interested parties is essential. It may require a presentation to the entire work force, along with an opportunity for questions and answers, before concerned parties' fears can be allayed.

When investigating cluster reports, be sure to speak to concerned parties. Frequently, there are other workplace issues such as labor-management problems. Lack of communication and/or mistrust can easily elevate a curiosity into "another example of management toying with us." Thus, the cluster issue may not be put to rest until other employee problems are identified and handled.

The second problem is that a chemical "culprit" will rarely be identified. When you attempt to explain this, the response often is to reaffirm that there is in fact something in the air or water which has caused the problem. Performing air monitoring of the work environment may reassure employees by demonstrating that there are presently no readily identifiable carcinogen(s) in the workplace. However, sufficient sampling at various times must occur to assure that sampling was performed under all appropriate conditions. Further objections may be derived from the fact that the current sampling does not reflect past exposure. Given the latency issue (time from first exposure to expression of disease), appropriate exposure modeling may be helpful.

Noncancer Clusters

Other types of reported clusters can include reproductive effects, indoor air complaints or "chemical sensitivities." Reproductive effects can run the gamut from infertility to spontaneous



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abortions to birth defects. Situations may also arise where breast lumps, menstrual difficulties and other issues such as decreased libido may be lumped together as part of the "reproductive" cluster. The larger the group, the less likely there is to be a single explanation.

Although not as serious, probably more daunting is the "symptom" cluster. Indoor air complaints and other complaints such as Multiple Chemical Sensitivity are frequently associated with a wide range of symptoms. It is difficult to determine where to begin with such complaints. Many times, these ill-defined entities are not a single diagnosable disorder but simply a constellation of disparate symptoms.

Symptoms may range significantly over the group and be the resulting combination of: real workplace exposures, exacerbations of pre-existing disorders, somatic expressions of work and individual psychosocial stressors, disgruntled employees, and other factors.

Even choosing a case definition to attempt classification is problematic. Usually, the result is so broad as to be meaningless clinically. Any group of people will have a high percentage of symptoms such as headache, fatigue, pain or GI upset at a given point in time. Also, studies have demonstrated that when there is a health concern or question of potentially hazardous exposure, the symptom rate climbs significantly. Bodily sensations or long standing symptoms, e.g. sore throat from pre-existing allergies, now receive focused attention by the individuals and frequently become significantly enhanced.

Approaching the Noncancer Cluster

By the time the "symptom" cluster is reported to management or other authorities for investigation, there is frequently a conviction within the affected group that the problem is real and something must be done - right away. Dismissing complaints as mass hysteria or intentional will in many instances just escalate the problem. An OSHA inspection, NIOSH health hazard evaluation and/or a lawsuit may result.

Performing a symptoms survey is a good place to start. While this can help you target where, if at all, to explore potential exposures, most surveys are not sufficiently focused to truly deter-

mine likely sources of concern. A better approach may be focused, detailed medical interviews by health providers. Accurate information surrounding time frames, frequency and range of symptoms, symptom intensity and consistency, pre-existing disease, etc. is essential and may only be gained in this manner.

In many instances, the gold standard for assurance is to perform exposure sampling. Evaluation of air, water and other sources for potential toxicants may help identify the culprit or help to demonstrate the lack of a toxic basis for the complaints.

Communication of the results of the investigation is critical. It should be done by a combination of management, health care professionals and possibly a few members of the affected group. This will demonstrate the commitment and concern of all parties and assist in assuring a consensus as to the potential work-relatedness of the complaints.

Single-Event Clusters

A leak, spill or other event may also trigger complaints. Cleaning of an HVAC system, laying down new carpeting, applying pesticides and other activities which were formerly considered routine and benign often produce complaints and sometimes result in emergency room visits and hospitalizations. Not too long ago, there was a tendency to dismiss these complaints as mass hysteria. However, there is frequently a basis for the complaints, although significant toxic effects may not be evident.

Turning on an HVAC system after maintenance may send odors of the cleaners through the building. Off-gassing of formaldehyde from new building materials may temporarily cause minor, but noticeable, irritation.

The odor issue in many instances appears to be the common link. Odors, like beauty, are highly dependent on individual response. In some instances, odors can create nausea and other temporary symptoms.

Odors also can serve as a trigger mechanism. Many individuals will automatically assume that because they smell something, they are being exposed. While technically that is correct, many odor thresholds are so low that toxic manifestations will not arise.

In cluster situations, the odor can


serve as an anxiety trigger. Many of the symptoms reported in these incidents are consistent with those produced by anxiety. Such symptoms can affect the skin, breathing and GI tract, and produce unpleasant sensations. Hyperventilation may not be recognized by the individual; however, its symptoms can be very distressing.

Just as in any hazmat response, you should have a detailed plan to approach these incidents, including: (1) rapid exposure testing, (2) symptom/complaint survey and analysis, (3) documentation of all on-site investigations, (4) results interpretation, and (5) communication. Following such a plan will go a long way to assure a logical and objective explanation of the "cluster."

Hazardous leaks and spills, along with real health effects, do occur. The "single incident" can also bring its own set of problems such as the development of reactive airways dysfunction syndrome (RADS) following an acute, high-level irritant exposure.

Emergency response procedures must include a detailed medical plan. Some individuals are highly suggestive or may be suffering from somatic manifestations of the stressful event. Early and detailed documentation is critical in these situations to ascertain the extent of health problems and prevent false claims of injury.

Summary

Clusters of health problems and complaints come in all shapes and sizes. Each one merits careful attention, investigation and scrutiny to determine the presence and underlying causes. Just as important is the communication of what you are doing and how you are doing it. Media and governmental attention are quickly focused on such "problems." Having a well-constructed approach for each "cluster" type will contain the situation and provide for appropriate health care and investigation. 

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