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Safety, Health and Hygiene: Cost-Effective, INTEGRATED, Program Strategies

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Introduction

Exposure monitoring and medical surveillance are typically a reaction to governing regulations. and two potentially robust data streams are rarely integrated. The overall picture is sometimes lost, which results in increased medical and/or industrial hygiene costs and liability risks. Health promotion programs are currently a response to the latest "vendor trend," and true medical management of the actual condition has not been introduced in a systematic or cost-effective approach.

Frequently, health and safety professionals are tasked with overseeing an enterprise's safety, health and hygiene efforts. Occupational safety and health programs in industry and government are increasingly under pressure to integrate with human resource and risk management programs among other corporate functions. They all share the growing costs of medical expenses, lost productivity, and employee replacement costs due to the explosion in the obesity-epidemic and those related disorders and risk factors (e.g., reduced exercise and processed food diets), including diabetes, arthritis, respiratory disease, and other illnesses.

Health and safety professionals are also often asked to wear "multiple hats" and oversee other areas, such as environmental compliance or security. Despite the convergence of responsibilities, there is still a lack of communication or a "silo" effect with respect to sharing of information or practices within many organizations.

A systematic approach for delivering standardized, evidence-based programs allows more cost-effective implementation of programs as well as a better integration of safety or industrial hygiene data with medical monitoring and surveillance and emerging trends. Aggregating data and comparing and

contrasting exposure monitoring and occupational health data potentially with disability, regulatory, and health benefits outcomes will allow the evaluation of trends, which improves the evaluation of the effectiveness of the programs as a whole.

Medical and Health and Safety Programs

Programs implemented within a specific facility, industry or other entity will vary, based on corporate culture, the types of activities performed, the materials used, and the degree of controls in place. Essentially, some form of a risk assessment has likely been performed to characterize the perceived or actual hazard; some common programs that are implemented can include:

- Hearing Conservation Program
- Medical Monitoring and Surveillance Program
- Respiratory Protection Program
- Hazard Communications Program
- Medical Standards and Fitness for Duty Determination
- Disease, Injury and Disability Management
- Pre-shift Safety Meetings (need to keep employee engaged)
- Annual Refresher Training (need fresh content)

All too frequently, the establishment of these programs generally is performed in response to governing regulations for that industry. In essence, the tests are performed, follow through is complete, and essentially treatment may be provided. It is less common that measures taken to prevent, ameliorate and otherwise impact the full range of disease, injury, exposure, and related financial and human cost impacts on both employees and employers. The requirements and associated coast of these programs are relatively minimal compared to the expected benefits; however, they still can provide a robust dataset especially if combined with the relevant exposure, health, and other important data that may exist and be readily available.

<u>Occupational and Non-occupational Health Issues</u>

Unfortunately, differentiating between work-related and non-work-related disease and disorders is never easy or clear-cut. Importantly, many of today's personal health risk factors produce similar, if not the same, adverse health effects that can be mistaken as occupationally related disorders contributed to by the workplace or limiting the ability to perform specific employee job tasks. By far and away the biggest impact today is from the obesity epidemic, both in the United States as well as worldwide. Being overweight and/or obese is associated with increased risk for hypertension, stroke, cardiac events, osteoarthritis, nerve entrapment syndromes (e.g., carpal tunnel syndrome), diabetes, and gastroesophageal reflux disease (GERD). An increasing average body mass index in the workforce can impact all of these items and more, increasing direct healthcare costs and many indirect costs. For example, GERD is associated with the development of both asthma and interstitial pulmonary fibrosis that can mimic occupational asthma or asbestosis/silicosis. Obesity and GERD can also produce declines in long-term pulmonary function parameters. Failure to account for these confounders may provide the appearance of an overexposure to toxic inorganic dusts or other hazards. Surveillance of musculoskeletal disorders (MSDs), and putative ergonomic work factors also need to be differentiated from the impact of obesity, diabetes, and other related concerns. Diabetes is associated with neuropathy (painful numbness and tingling in the extremities) that may mimic work symptoms related to significant exposure to certain solvents, or someone with an alcohol abuse problem, or both. Similarly, diabetes is also associated with mild cognitive impairment.[i] Without solid exposure monitoring data to compare and contrast against such individual/group "findings," improper conclusions and potentially wasting of resources "medically working up" workers, regulatory reporting of such abnormalities could result.

Productivity is an essential key to the success of any business. Absenteeism due to smoking-related respiratory and cardiovascular disease, or obesity problems and their related medical and human resource costs can make joint occupational/non-occupational disease management and risk factor control a central function of all safety and health efforts. When employee, regulatory and other concerns, arise comparison for example, of neurological disease experienced in traditional medical expenses with symptoms found in health screening exercises with well-documented welding emission measurements, may allay the latest health 'issue du jour" that Parkinson's disease may be welding (i.e., managanese) related.

Simple monitoring of weight, medication compliance, diabetes control, blood pressure as part of ongoing exposure-driven medical monitoring provides tremendously useful information to assist personal physicians, corporate-sponsored health promotion initiatives in enhancing the health, well-being and productivity of employees, and even their family members. This blending across traditionally separate company functions with relatively minimal costs can help bring home the importance and financial viability of occupational safety and health programs when appropriately performed and managed.

Medical Examinations

The art and utility of performing medical evaluations for a wide range of reasons has only recently become a truly integral feature of the multi-headed creature that safety and health professionals have previously thought was just the domain the "local doc." Evaluations frequently occur for:

- Pre-placement for the appropriate job function
- Return to work from health benefits, FMLA, disability, workers' compensation or other related processes
- Periodic and immediate fitness for duty, e.g., respiratory protection, "troubled/poorly functioning" employees
- Medical monitoring for current or past workplace exposures
- Regulatory-mandated examinations

Regardless of the intended reason, these on-site, clinic-based, or mobile health screening assessments provide the opportunity to obtain key data that can identify adverse work-related symptoms or findings, determine personal risk factors for future disease that can be managed or reduced through health promotion efforts, assure compliance with medical care directives a,nd meet the full panoply of congressional and regulatory hoops required of business today.

Key to cost-effectiveness and return on investment, as well as medical appropriateness, is the careful construction of "as-needed," business-necessary exam types and related exam component complement strategy. Focused, targeted, medical examinations, health questionnaires, functional screens and low-cost testing have generally been available for a number of years but not combined in a well-thought-out attack based on actual employee and employer needs. The streams of data of the various existing information systems, which are routine in most business concerns, make individual and group trending truly beneficial to safety and health's overall goals and objectives.

Medical Standards

Clinical decision-making is expected in any medical practitioner encounter whether work-related or not. In fact, it is not hard to generate medical data through questionnaires, testing equipment, imaging studies, or even strength or other functional screenings. The critical component is, "What does this mean in terms of a worker performing a job, returning to a job, compliance with risk factor reduction, success of various treatment regimens?" This is the essence of medical standards; that is, medically-speaking, is

there solid evidence that can be replicated in an easy-to-use, standardized fashion, that will pass ADA, FMLA, OSHA, and MSHA muster or any other regulatory hurdle. Can someone safely wear a respirator? Can someone with minimal x-ray evidence of silicosis still be exposed to a very low level of silica in a job without wearing respiratory protection? Can we reduce the opportunity for injury?

Medical standards are based on job and exposure task analyses, evidence-based decision matrices from the scientific and medical literature, accepted standards of care, and so forth. Simple, concise "standards" can be imbedded into the medical examination program, along with corresponding forms, including results and recommendation forms that, in conjunction with currently available information technology can assure fair and balanced evaluation of all individuals without regard to the presence of disabilities and membership in other groups. These evidence-based decision trees also quickly generate information to assure that no group undergoes disparate consideration, and only business necessity-based, medically-justified actions are taken.

How to Integrate Programs

Data over successive years can be looked at in a silo to determine respective IH or medical trending but looked at collectively, one can start dissecting which controls have greatest impact, where is focus needed most, or are exposure controls contributing to reductions in injury and illnesses. Some OSHA standards implicitly lead to the collection of both data-streams but, combined with the right expertise, the joint dataset is a powerful tool to reducing bottom-line organizational costs. Many of you may already have elements of both data-streams; the key is to combine and see what additional value you can use to bring to organization.

Integration of Results—Data Examples

In many cases, the data from both medical and industrial hygiene (IH) sources can be used to evaluate the effectiveness of control programs, not only from the perspective of compliance with regulations, but from the evaluation of the development or lack thereof of medical conditions. An example that SOMA will describe shows that, in a large cohort of mining employees, aggregated from several clients, that both the exposure results with respect to crystalline silica and the respiratory medical trends are in agreement. In this cohort (10 years of cumulative data), the exposure results are quite low, on average silica concentrations are at approximately one-quarter of the permissible exposure limit (PEL). The medical trends from respiratory surveillance results show that the aggregated and averaged reductions in the forced vital capacity (FVC) and forced expiratory volume over one second (FEV1) are in-line with or better than that expected of the general population.

In a similar cohort, noise exposure results can be compared very favorably to the findings of recordable standard threshold shifts (STSs) in the same population. The trend of the overall exposure results, which were also below PELs, has trended downward along with the STS cases.

In another example, the use of IH data was used to help describe why medical surveillance was not necessarily appropriate with sub-cohorts of residential construction workers, While discussing the need for medical surveillance for workers with respect to noise exposure with a professional association involved in the business, we hypothesized that not all of the trades within the profession would have similar noise exposures and therefore may not need to be treated the same with respect to medical surveillance. The IH date described statistically significant differences between some of the evaluated trades.

Information technology resources, specifically databases and systems that help manage and house the data, make the comparison of separate data-streams, and ultimately integration, much more manageable. Evaluating the trends of large cohorts of workers may require fairly significant volumes of data to improve statistical power and significance.

Return on Investment

In addition to integrating the data to better understand the interaction between health and safety data, and medical data, the information can also be used to start understanding the return on investment (ROI) associated with various programs. Traditionally felt to be a "soft" area for financial analysis, there are a number of published studies and documented case examples of positive return on investing for exposure monitoring, health surveillance, health promotion and focused medical case management. These include two large reviews of relevant studies [ii],[iii],[iv] as well as individual studies demonstrating positive financial impact and programmatic efficacy [v],[vi], [vii](Bareau, 2006; Heaney, 1997; Kessler, 2007; Loeppke, 2007).

An example that SOMA will describe shows the relationship between lung cancer and diesel exhaust exposure. The Mining Safety and Health Administration (MSHA) published a rule in January 2001,[viii] and in the preamble, there are materials provided that estimate the number of lung cancer cases associated with exposure to diesel exhaust. The corresponding graphs show reductions in lung cancer cases expected with a decrease in exposure to diesel particulate matter (DPM). The rates of decrease vary, based on different studies but one of the studies with the lowest decrease in lung cancer cases show a reduction of about 22 lung cancer cases when the DPM levels are dropped by approximately 300 micrograms per cubic meter of air.[ix] Actual costs associated with lung cancer vary, depending on the direct and indirect costs associated with the analysis, but studies show that the cost of cancer may range from between $100,000 per case to several million dollars per case.[x]

In another example, SOMA has collected noise dosimetry data and sound level measurements from manufacturing facilities, along with estimations of the corresponding costs associated with managing and remediating the conditions, leading to excessive noise exposure and potential costs for handling hearing loss claims per facility. The costs of this monitoring and the repair efforts can be easily compared to published data with the costs associated with a hearing loss claim to provide sound, convincing evidence that preventive engineering maintenance is a much lower initial cost than the time, expense and potential employee injury associated with complacency or no attention.[xi]

Endnotes

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