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Establishing and Implementing an Effective Industrial Hygiene Program

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Overview

- What is Industrial Hygiene?
- Why do I need an Industrial Hygiene Program?
 - Health vs. Safety Statistics
 - Legislative Requirements
- Basic components of an Effective Industrial Hygiene Program
- Keys to Successful Implementation
- Common mistakes of Industrial Hygiene sampling plans
- Concluding remarks



What is Industrial Hygiene?

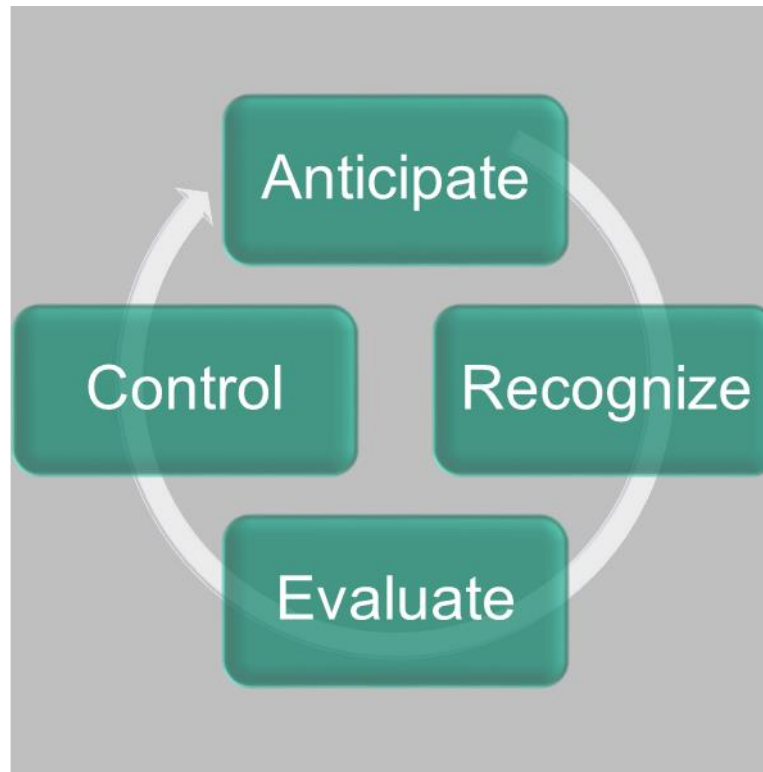


What is Industrial Hygiene

- The art and science dedicated to the anticipation, recognition, evaluation and control of environmental stressors arising from the work place that may result in injury, illness or impairment or affect the well being of workers and members of the community.



What is Industrial Hygiene





Role of the Industrial Hygienist

- The hygienists role is to, by utilizing the model, reduce or eliminate the workplace hazards.
 - Anticipate potential hazards associated with a specific process or, for example, introduction of a new material in the workplace.





Role of the Industrial Hygienist

- Recognize the anticipated hazards, which is closely related to the anticipation. The recognition process requires training in toxicology, chemistry, ergonomics, engineering and other branches of science.
- Evaluate if the exposure risk that has been identified is considered significant or not. Qualitative and quantitative assessment of a worker's exposure hazards.



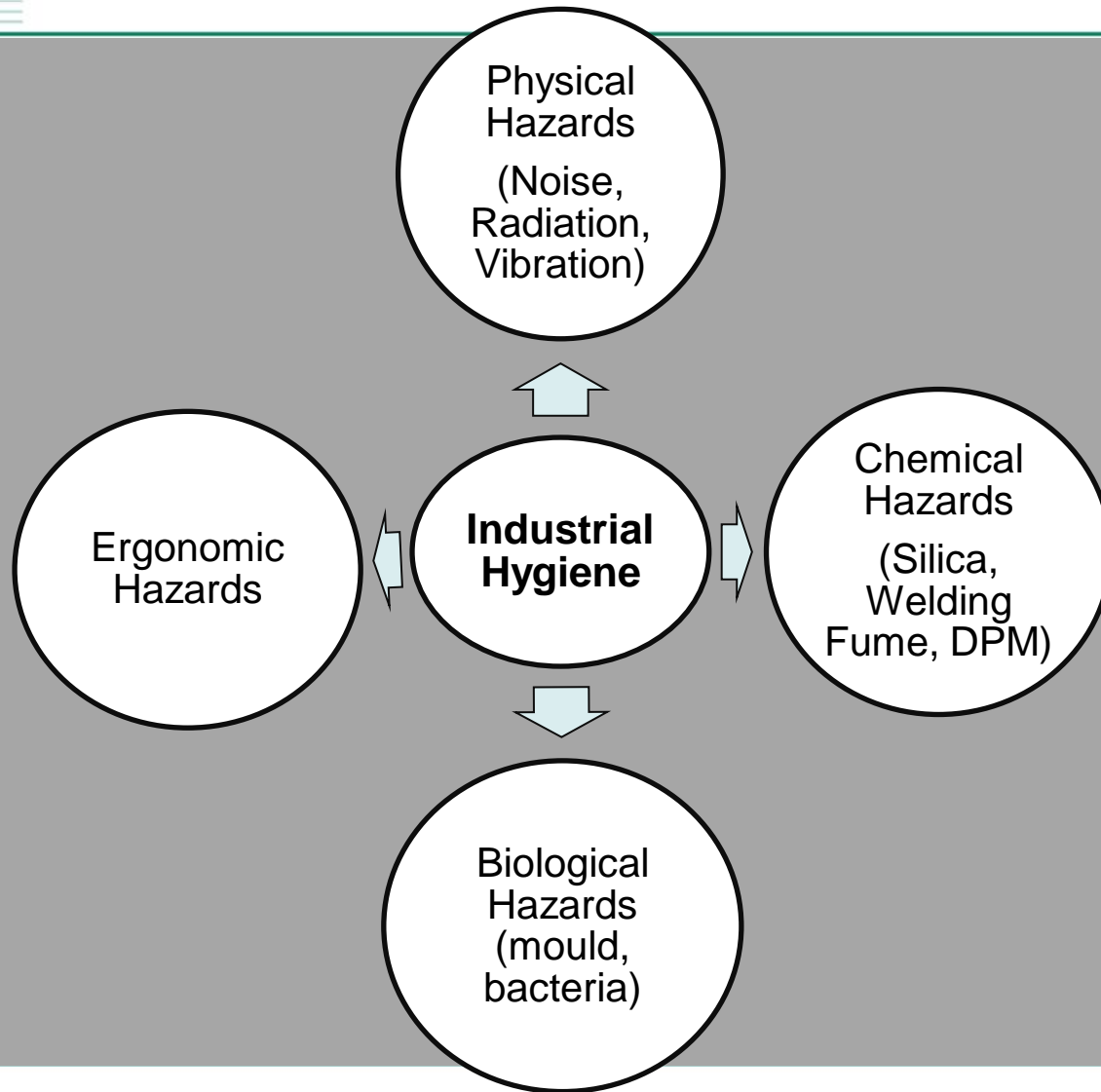
Role of the Industrial Hygienist

- When a potential exposure to hazardous agents in the workplace cannot be avoided, implement control measures with the purpose to reduce or eliminate the exposure.



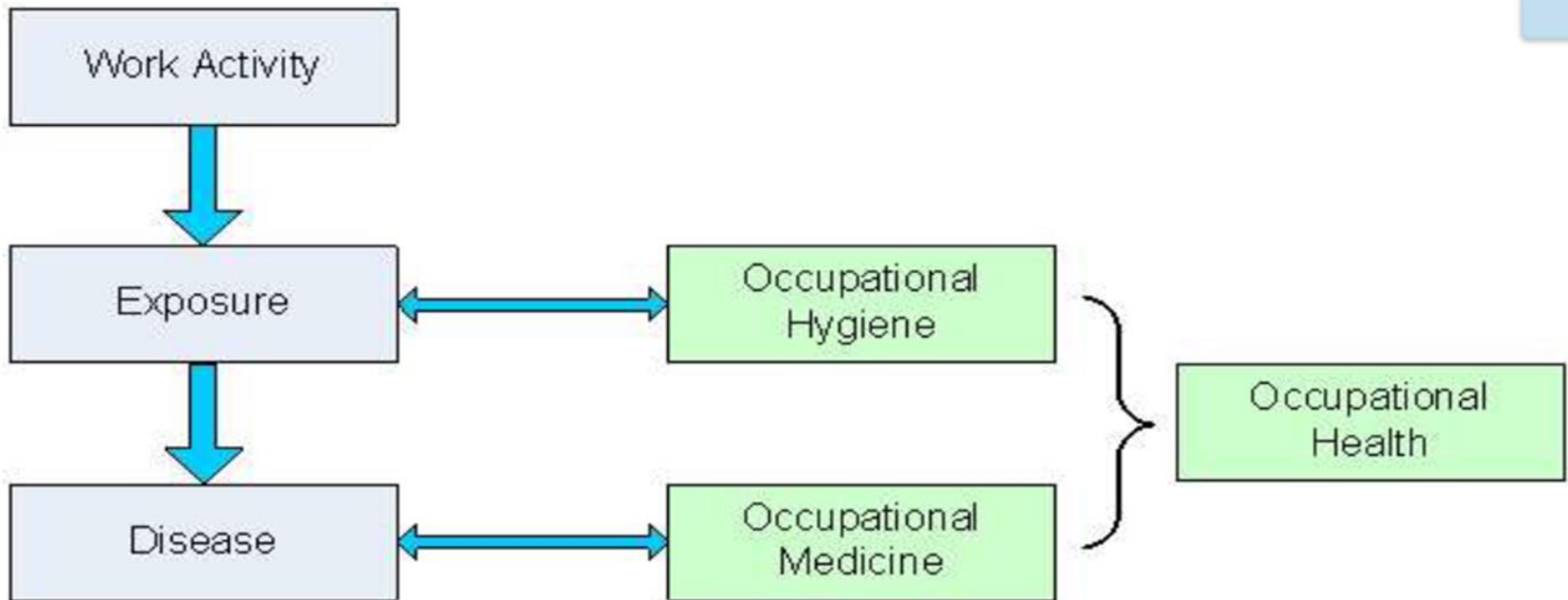


What is Industrial Hygiene





What is Industrial Hygiene





Why do I need an Industrial Hygiene Program?



Health vs. Safety



Global Estimates of the Burden of Injury and Illness at Work 2012...

- Globally 2.3 million deaths due to occupational circumstances.
- Occupational Injuries = 318,000 deaths
- Work Related Diseases = 2,022,000 deaths

Disease	Percentage of Workers Effected
Work Related Cancer	32%
Work Related Circulatory Diseases	23%
Cardiovascular and Stroke / Communicable Diseases	17%
Occupational Accidents	18%

Takala et al., Global Estimates of the Burden of Injury and Illness at Work in 2012.



Global Estimates of the Burden of Injury and Illness at Work 2012...

Country	Acute Fatalities Reported	Fatal Work Related Diseases
Canada	465	11,330
U.S.A.	5,214	95,808
Australia	207	6,962
Totals (Top 27 Industrialized Nations)	11,850	306,988

Takala et al., Global Estimates of the Burden of Injury and Illness at Work in 2012.



Ontario Mining Sector

- Between 2005 and 2014, 184 workers died in Ontario's mining sector from occupational diseases. Between 2004 and 2013 there were 24 acute fatalities reported to the Ministry of Labour
- Occupational disease was identified as one of the top ranked hazards in the 2014 underground mining sector risk assessment completed as part of the Mining Health and Safety Prevention Review.

Occupational Disease In Mines



Mining Health and Safety Prevention Review

“While traumatic fatality incidents in the mining sector have declined substantially over the past several decades, deaths related to occupational illness have not.”

“Working in a closed underground environment, miners can be exposed to airborne hazards, such as diesel emissions and silica, putting them at higher risk of developing occupational illness. The Review heard that both supervisors and workers need better education and training so they are more aware of the seriousness of airborne health hazards in underground mines.”



Mining Health and Safety Prevention Review

The Ministry of Labour to require that mining employers address the priority hazards identified in the risk ranking exercise:

- Require employers to prepare a formal plan to manage hazards that cause occupational illness, including requirements for worker and supervisor training and communication

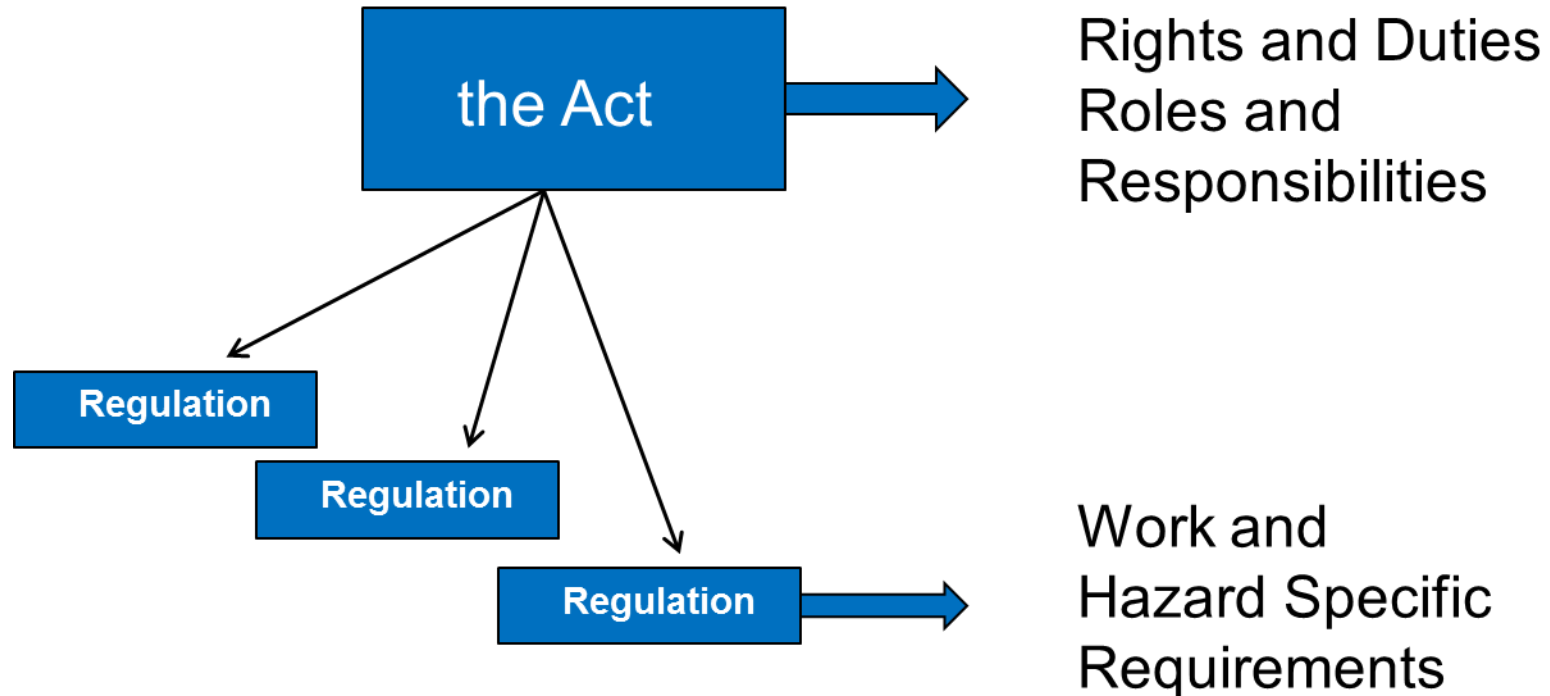


Legislative Overview



Industrial Hygiene – Legislation Overview

- The Act is formed of several parts, including specific regulations.



- **OH&S Act - Section 25 & 26 - Employer Duties:**
 - Take every precaution reasonable in the circumstances to protect the health and safety of their workers and other workers present at the work site.
 - Ensure that workers working for them are aware of their rights under the Act.
 - Ensure that the tools, appliances or equipment are in safe operating condition, and are capable of performing the tasks they are needed for.



Legislated Duties

- **OH&S Act - Section 28 - Employee Duties:**
 - take reasonable care to protect their safety and the safety of other workers present at the work site; and
 - cooperate with their employer to protect the health and safety of themselves and others at the work site.



Legislative Overview

- **Regulations/Guidelines include:**
 - Mines & Mining Plants – Ontario Regulation (O.Reg.) 854/90, as amended.
 - Construction Projects – O.Reg.213/91, as amended.
 - Control of Exposure to Biological or Chemical Agents – O.Reg.833/90, as amended (will apply to construction sites as of July 1, 2016).
 - Workplace Hazardous Materials Information System (WHMIS) – O.Reg.860/90.
 - Designated Substances – O.Reg.490/09, as amended (includes lead, arsenic, silica).
 - Guidelines – Lead/Silica on Construction Projects.
 - Designated Substance – Asbestos on Construction Projects and in Buildings and Repair Operations, O.Reg.278/05, as amended.



Basic Components of an Effective Industrial Hygiene Program



Industrial Hygiene Program

- Program with stated purpose, scope, responsibilities, measures & procedures, resources
- Training (hazard information, control comprehension / application)
- Engineering & Administrative Controls
- Personal Protective Equipment
- Worker Exposure Assessment
- Qualitative & Quantitative
- Control Evaluation
- Medical Monitoring (required for silica control programs)
- Record keeping



Industrial Hygiene Program *(cont'd)*

- Identify a person responsible to oversee program
- Preliminary exposure assessments to identify potentially problematic exposures
- Identify suitable control measures
- Select, provide & maintain respiratory protection for interim / short term use, if necessary
- Identify hazard areas
- Provide orientation & ongoing training to workers
- Maintain records in an easily understood format & available for inspection (including work site conditions & jobs performed)



Industrial Hygiene Program *(cont'd)*





Keys to Successful Implementation



Keys to Successful Implementation

- Buy-in... from everyone, but top down leadership is critical to starting up an effective program. Once some trust has been established buy-in from workers will follow.
- Resources... everything from people to money to training.
- Educate... workers and management need to understand the risks of chronic workplace hazards. Industrial hygiene can be a scary topic, need to dispel the fear around this.
- Report... once you've collected data it is critical that this data is shared, regardless of the results.
- Act... you're collecting the data for a reason, once you have it, actions are necessary.
- Measure... review your program regularly and revise it as necessary. Are you meeting your goals? Is the program effective? Are exposures going down, do you understand them better? Do you have a defensible program?



Common Mistakes of Industrial Hygiene Sampling Plans



Common Mistakes

- NO PLAN!
- Reactive approach to IH problems
 - Complaints
 - Orders
 - Claims
 - Etc.





Common Mistakes

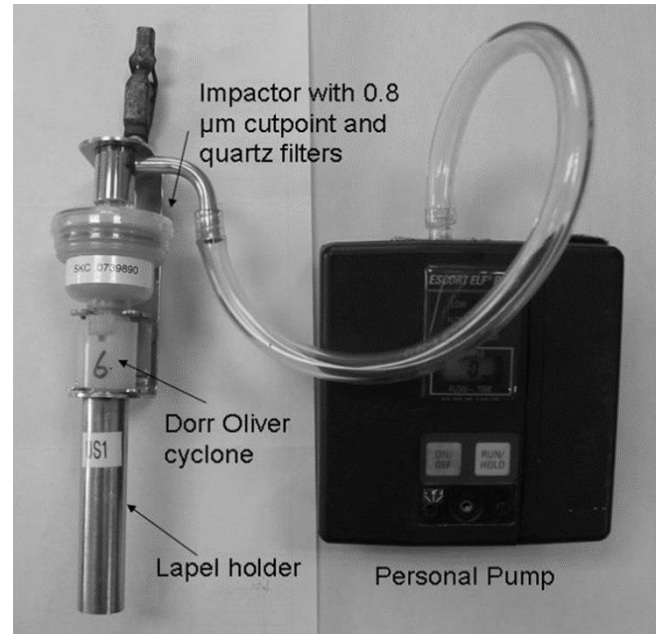
- Lack of Knowledge
 - Competency of IH staff
 - Incorrect methods, equipment, media, etc.
 - Incorrect interpretation of results





Common Mistakes

- Inadequate Risk Assessment
 - Qualitative/Quantitative
 - Undefined similar exposure groups
 - Defensible data





An Example...



Let's Get it Right! A Quick Example...

ID Hazards & Obtain Info on Hazard Properties



Assess Worker Exposure



Risk Evaluation



ID Actions



Document and Communicate Outcomes to Stakeholders



Getting it right

- Identify Areas With High Traffic
- Observe Habits
- Interview Workers
- Review job tasks – Watch them work!
- Create Similar Exposure Groups (SEG's)
- Sample and Refine Similar Exposure Groups



How many samples

Table 1: NIOSH Recommended Sample Size

Size of SEG	Recommended Number of Samples
< 6	all
6	5
7	6
8 - 11	7
12 - 14	8
15 - 18	9
19 - 26	10
27 - 43	11
44 – 50	12
50+	14



Sampling Data

- Why so many samples?
 - Need to have statistically valid data set (95% UCL). The data needs to be representative, reproducible and readily interpretable
 - Exposure profiles need to be appropriately characterized
 - Baseline data will serve as the starting point for determining which occupational exposures require action and prioritizing which ones to address first.



Concluding Remarks



Summary

The challenge:

- Occupational diseases are real and preventable

A solution:

- Having an effective Industrial Hygiene Program is your best “frontline” defense to preventing occupational disease

Employers need to understand workplace exposures so they can eliminate them or effectively control them. Risk Management

Qualitative risk assessment is the starting point for understanding your workplaces potential exposures, without this step you can't have an effective program or sampling plan.

Education is essential, all workplace parties need to be aware of chronic hazards and how to eliminate/control them.



Questions

