

**University of Salahaddin - Erbil**  
**College of Science**  
**Env. Science and Health Dept.**

# Introduction to Industrial Hygiene

# What Is Industrial Hygiene?

- Definition

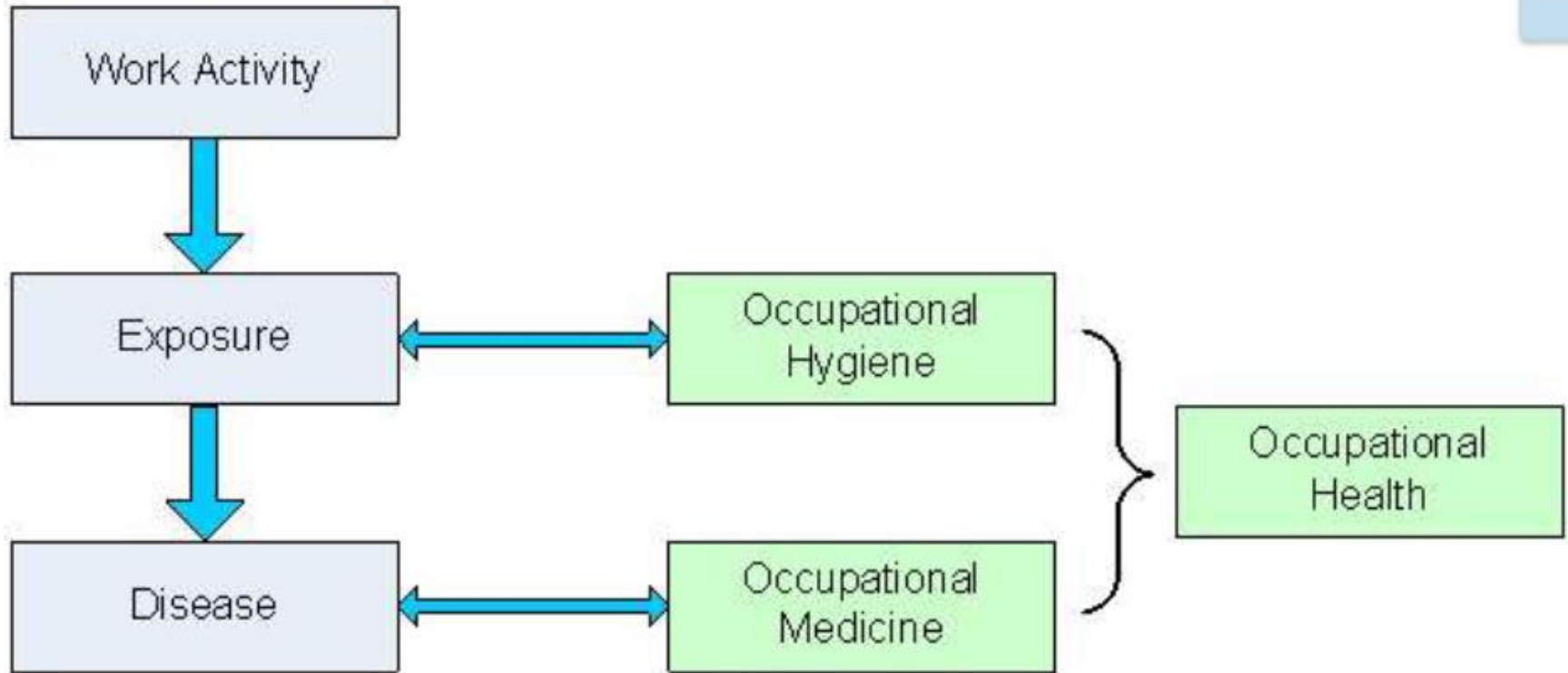
- Industrial Hygiene may be defined as the science of anticipating, recognizing, evaluating, and controlling workplace conditions that may cause workers' injury or illness, impaired health and well-being, or significant discomfort and inefficiency among workers or among the citizens of the community.

# IH Defined

- Industrial hygiene is the science of protecting and enhancing the health and safety of people at work and in their communities.
- Health and safety hazards cover a wide range of chemical, physical, biological and ergonomic stressors.
- Those dedicated to anticipating, recognizing, evaluating and controlling those hazards are known as industrial hygienists.

# Industrial Hygiene/Occupational Health

-EH&S (Environmental, **Health** & Safety)

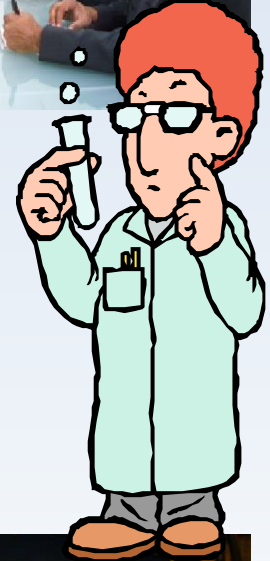


# What Is an Industrial Hygienist?

- A person who by study, training, and experience can:
  - Anticipate
  - Recognize
  - Evaluate
  - Controlworkplace environmental hazards

# Industrial Hygienist

- IHs wear many different hats
- Sometimes as a:
  - Scientist
  - Investigator
  - Trainer/Educator
  - Technician
  - Policy enforcer
  - Engineer
  - Emergency Responder
  - and more!



# What does an Industrial Hygienist do?

- As mentioned before, industrial hygienists are charged with anticipating, recognizing, evaluating, and controlling workplace hazards. These broad topics filter into common roles such as the following:
  1. Investigating and examining the workplace for hazards and potential dangers
  2. Making recommendations on improving the safety of workers and the surrounding community
  3. Conducting scientific research to provide data on possible harmful conditions in the workplace

- 4. Developing techniques to anticipate and control potentially dangerous situations in the workplace and the community
- 5. Training and educating the community about job-related risks
- 6. Advising government officials and participating in the development of regulations to ensure the health and safety of workers and their families
- 7. Ensuring that workers are properly following health and safety procedures.



# Job Diversity

- Industrial hygienists are not limited to one particular type of industry; they are employed in a variety of organizations such as:
  - Chemical companies
  - Colleges and universities
  - Government
  - Insurance companies
  - Manufacturing companies
  - Public utilities
  - Research laboratories
  - Consulting firms
  - Hospitals
  - Hazardous waste companies

# An Effective Industrial Hygiene Monitoring Program... ?

- Will serve to identify, evaluate, and quantify hazard exposures
- Allows the organization to prioritize the workplace hazards in order to assign resources towards the control or elimination of the hazards
- Thus, preventing injuries and illnesses from recurring.
- Less absences due to injuries or illnesses
- Increase worker productivity and potential
- More efficient processes and improved technology.

# Sources of Hazard Information

Hazard Information is available in many different forms:

- General Knowledge of Chemicals and Processes
- General Knowledge of the Materials Used
- Observations of Work Practices
- Safety Data Sheets (SDS)
- Review of Plans for New Facilities and Renovations
- Conversations with Workers
- Objective Data

- Types of Processes
- Number of Employees
- Types of Exposures
- Historical Injury/Incident Data
- Review of Historical Data/Information
- Test Reports/Chemical Analyses
- Earlier Monitoring Data
- Information from Professional Associations, Colleges, Universities, and Government documenting Previous Studies, Results, and Findings and Research Data



# What Are Different Types of Industrial Hygiene Hazards?

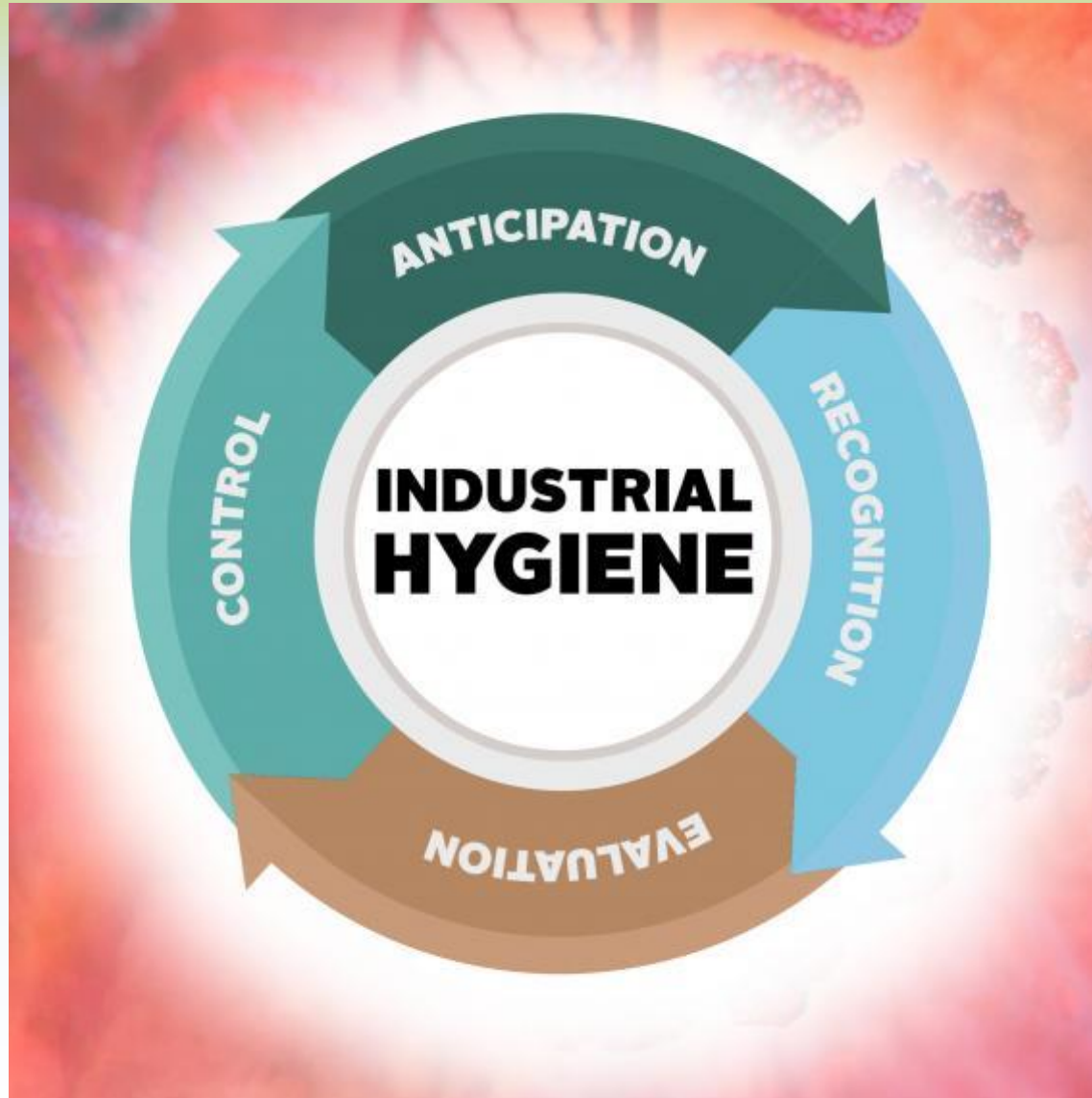
**Chemical Hazards**

**Physical Hazards**

**Biological Hazards**

**Ergonomic Hazards**

# The four (4) elements of Industrial Hygiene are



# Anticipation

- Involves identifying potential hazards in the workplace before they are introduced.
- *Example*
  - A funeral home employee (embalmer) works with embalming fluids that contain a carcinogen known as **formaldehyde**.
  - Is the employee being protected while working?
    - What is in the fluid, how does the employee use it, where is it being used and how often?



# Recognition

- Involves identifying the potential hazard that a chemical, physical or biological agent - or an adverse ergonomic situation - poses to health.
- *Example*
  - The IH researches the chemicals (in this case **formaldehyde**) to understand the hazards and performs an assessment to determine how the employee(s) will be/are using it.
  - Interviews, inspects, reviews medical surveillance programs, health and epidemiology studies, worker health complaints, occupationally-related compensation claims, and industrial hygiene monitoring information.





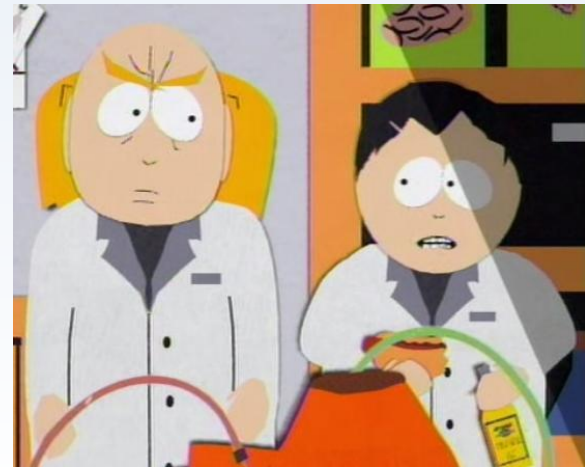
# Anticipate & Recognize Review

- Anticipate or recognize things such as:
  - **Chemical agents:** gases, vapors, solids, fibers, liquids, dusts, mists, fumes, etc.
  - **Physical agents:** noise and vibration, heat and cold, electromagnetic fields, lighting etc.
  - **Biological agents:** bacteria , fungi, etc.
  - **Ergonomic factors:** lifting, stretching, and repetitive motion
  - **Psychosocial factors:** stress, workload and work organization
- Once anticipated or recognized, the hazard can then be evaluated and eventually controlled to eliminate or reduce the impact of the hazard.

# Evaluation



- Evaluate the extent of the exposure.
- This often involves measuring the personal exposure of a worker to the hazard/agent in the workplace and understanding what PPE they currently use.
- Compare to **SDS** recommendations including occupational exposure limits, where such criteria exist.
- *Example*
  - Depending on the use, the IH may collect personal breathing air samples to determine his/her exposure to help select the most appropriate PPE for inhalation. Absorption and ingestion potential will also be reviewed.



# Control

- Control of the chemical, physical or biological agent - or adverse ergonomic situation, by procedural, engineering or other means where the evaluation indicates that this is necessary.
- *Example*
  - If results show the chemical is hazardous, the best idea is to find a less hazardous replacement or engineer a solution (e.g. ventilation). If not, adding administrative controls or adding PPE may be necessary.



- Embalmers previously used arsenic.
  - They've replaced it with less hazardous (but still hazardous) formaldehyde
- Ventilation may be added to controls
- PPE such as gloves are used



