Identifying Safety and Health Hazards

Hazard, risks, outcomes

The terminology used in general:

- A hazard is something that can cause harm if not controlled.
- The outcome is the harm that results from an uncontrolled hazard.
- A risk is a combination of the probability that a particular outcome will occur and the severity of the harm involved.

“Hazard”, “risk”, and “outcome” are used in other fields to describe e.g. environmental damage, or damage to equipment. However, “harm” generally describes the direct or indirect degradation, temporary or permanent, of the physical, mental, or social well-being of workers. For example, repetitively carrying out manual handling of heavy objects is a hazard. The outcome could be a musculoskeletal disorder (MSD) or an acute back or joint injury. The risk can be expressed numerically (e.g. a 0.5 or 50/50 chance of the outcome occurring during a year), in relative terms (e.g. "high/medium/low"), or with a multi-dimensional classification scheme (e.g. situation-specific risks).
Hazard Assessment

Hazard analysis or hazard assessment is a process in which individual hazards of the workplace are identified, assessed and controlled/eliminated as close to source (location of the hazard) as reasonable and possible. As technology, resources, social expectation or regulatory requirements change, hazard analysis focuses controls more closely toward the source of the hazard. Thus hazard control is a dynamic program of prevention. Hazard-based programs also have the advantage of not assigning or implying there are "acceptable risks" in the workplace. A hazard-based program may not be able to eliminate all risks, but neither does it accept "satisfactory" -- but still risky—outcomes. And as those who calculate and manage the risk are usually managers while those exposed to the risks are a different group, workers, a hazard-based approach can by-pass conflict inherent in a risk-based approach.

Risk Assessment

Modern occupational safety and health legislation usually demands that a risk assessment be carried out prior to making an intervention. It should be kept in mind that risk management requires risk to be managed to a level which is as low as is reasonably practical.

This assessment should:

- Identify the hazards
- Identify all affected by the hazard and how
- **Evaluate the risk**
- **Identify and prioritize appropriate control measures**

The calculation of risk is based on the likelihood or probability of the harm being realized and the severity of the consequences. This can be expressed mathematically as a quantitative assessment (by assigning low, medium and high likelihood and severity with integers and multiplying them to obtain a risk factor, or qualitatively as a description of the circumstances by which the harm could arise. The assessment should be recorded and reviewed periodically and whenever there is a significant change to work practices. The assessment should include practical recommendations to control the risk. Once recommended controls are implemented, the risk should be re-calculated to determine if it has been lowered to an acceptable level. Generally speaking, newly introduced controls should lower risk by one level, i.e., from high to medium or from medium to low.

### Common workplace hazard groups
• Mechanical hazards include:

*By type of agent:*

  • Impact force
    - Collisions
    - Falls from height
  • Struck by objects
  • Confined space
  • Slips and trips
  • Falling on a pointed object
  • Compressed air/high pressure fluids (such as cutting fluid)
  • Entanglement
  • Equipment-related injury

*By type of damage:*

  • Crushing
  • Cutting
  • Friction and abrasion
  • Shearing
  • Stabbing and puncture

• Chemical hazards include:

  • Acids
  • Bases
  • Heavy metals
    - Lead
  • Solvents
    - Petroleum
  • Particulates
    - Asbestos and other fine dust/fibrous materials
    - Silica
  • Fumes (noxious gases/vapors)
  • Highly-reactive chemicals
  • Fire, conflagration and explosion hazards:
    - Explosion
    - Deflagration
    - Detonation
    - Conflagration

• Psychosocial issues include:

  • Work-related stress, whose causal factors include excessive working time and overwork
Fire prevention (fire protection/fire safety) often comes within the remit of health and safety professionals as well.

**OCCUPATIONAL SKIN DISEASES**

An occupational skin disease is one in which workplace exposure to some physical, chemical or biologic hazard has been a causal or a major & necessary contributing factor in the development of the disease.

- **other physical hazards:**
  - Noise
  - Vibration
  - Lighting
  - Barotrauma (hypobaric/hyperbaric pressure)
  - Ionizing radiation
  - Electricity
  - Asphyxiation
  - Cold stress (hypothermia)
  - Heat stress (hyperthermia)
    - Dehydration (due to sweating)

- **Biological hazards include:**
  - Bacteria
  - Virus
  - Fungi
    - Mold
  - Blood-borne pathogens
  - Tuberculosis

- **Violence from outside the organization**
  - Bullying, which may include emotional and verbal abuse
  - Sexual harassment
  - Mobbing
  - Burnout
  - Exposure to unhealthy elements during meetings with business associates, e.g. tobacco, uncontrolled alcohol

- Musculoskeletal disorders, avoided by the employment of good ergonomic design

- Other physical hazards:
  - Noise
  - Vibration
  - Lighting
  - Barotrauma (hypobaric/hyperbaric pressure)
  - Ionizing radiation
  - Electricity
  - Asphyxiation
  - Cold stress (hypothermia)
  - Heat stress (hyperthermia)
    - Dehydration (due to sweating)

- Biological hazards include:
  - Bacteria
  - Virus
  - Fungi
    - Mold
  - Blood-borne pathogens
  - Tuberculosis

- Violence from outside the organization
  - Bullying, which may include emotional and verbal abuse
  - Sexual harassment
  - Mobbing
  - Burnout
  - Exposure to unhealthy elements during meetings with business associates, e.g. tobacco, uncontrolled alcohol

- Musculoskeletal disorders, avoided by the employment of good ergonomic design
Contact Dermatitis accounts for at least 60% of occupational dermatoses.

The industries most likely to result in occupational dermatitis are:
- FOOD HANDLERS
- HAIRDRESSERS
- MEDICS/DENTISTS/NURSES/VETS
- GARDENERS
- CLEANING/LAUNDRY
- PAINTING
- CONSTRUCTION/ENGINEERS

Contact Irritant Dermatitis
An irritant is a substance which will induce dermatitis in anyone if applied to the skin

- In high enough concentrations
- Over sufficient time
- Or with sufficient frequency

Irritant contact dermatitis is therefore concentration dependent

Management of contact irritant dermatitis

Treat with steroids, emollients, antibiotics.
Reduce exposure by:
1-REDUCE FREQUENCY OF EXPOSURE
2-SUBSTITUTE LESS IRRITATING CHEMICALS
3-AVOID OCCLUSION
4-AVOID SKIN TRAUMA
5-AVOID EXCESSIVE HEAT & HUMIDITY

Occupational Infections:

Human papilloma virus type 7 warts occur in butchers, fishmongers and poultry processors.
Some infections may be transmitted from animals to man in those who work with animals eg. Orf and milker’s nodules.
Physical Agents:

Friction blisters
Raynaud’s phenomenon
Miliaria (sweat duct occlusion)
Chilblains

Miscellaneous Occupational Dermatoses
Folliculitis (eg. Auto mechanics) •
Chloracne •
Viteligo (rubber industry) •
Acrosclerosis due to silicosis •

Contact Allergic Dermatitis

Involves Type IV (cell mediated) immune reaction. •
Allergic reactions are NOT concentration dependent

Some causes:
Seafood
Various fruits
Various vegetables
Meat/ blood
Animal secretions
Rubber latex

The time interval between the first contact with a chemical and development of sensitization depend on:
THE CHEMICAL
THE CONDITION OF EXPOSURE
CONSTITUTIONAL FACTORS

Management of contact urticaria
Treat the underlying dermatitis
Avoid the chemical which induces contact urticaria
Change of work may be required