

Strategies for the Prevention of Occupational Diseases



Labour Department



Safety at work

Strategies for the Prevention of Occupational Diseases



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Strategies for the Prevention of Occupational Diseases

Introduction

Occupational hazards in various industries can affect employees' health and cause occupational diseases in severe cases. The most effective way to prevent occupational diseases is to eliminate or control the hazards at source. This booklet introduces a hierarchy of control measures to raise the awareness of employers and employees to the strategies for preventing occupational diseases. It is only by adopting appropriate and effective preventive measures that employees could be protected from contracting such diseases.

Occupational Diseases

The International Labour Organization defines occupational diseases as those having a specific or strong relationship with exposure to physical, chemical, biological or psychosocial factors at work, and these environmental factors are the predominant causes of such diseases. In recent years, silicosis, occupational deafness, tenosynovitis of the hand or forearm are the common occupational diseases in Hong Kong.

Common hazards causing occupational diseases can generally be grouped into the following categories:

1. Physical Hazards

Physical hazards commonly found in the work environment include temperature, humidity, air pressure, noise, vibration, lighting and radiation, etc.

2. Chemical Hazards

Different chemicals have their own properties. They can exist in the work environment in different forms, including liquid, gas, vapour, solid and air particles (dusts, fumes), etc. Chemicals commonly used in the workplace include solvents, cleansing agents, acids and alkalis, etc.

3. Biological Hazards

Biological hazards commonly found in the work environment are micro-organisms including pathogenic bacteria, viruses and fungi, etc. They can enter the human body through different channels such as by air, skin, or contact with mucous membrane, thus causing different occupational diseases. Common ones include tuberculosis, *Streptococcus suis* infection and leptospirosis, etc.

4. Ergonomic Hazards

Ergonomics refers to the interaction between human and the work environment and tools. Improper interaction can lead to poor posture at work, resulting in musculoskeletal disorders and reduction in work efficiency. Common ergonomic hazards at the workplace include incompatibility between the height of chairs and tables or the size of tools with the body build of employees.

Prevention of Occupational Diseases - Principles and Measures



Identifying hazards at work is the first step to prevent occupational diseases. By using the grouping method described above for categorising hazards, the hazards can be systematically identified for control. In addition, reviewing the adequacy and effectiveness of control measures already in place, formulating and adopting further appropriate measures, and stepping up

monitoring are also important for the prevention of occupational diseases. The hierarchy of control measures introduced below can be adopted, if appropriate, for the control of different hazards in the work environment for the purpose of preventing occupational diseases.



(A) Elimination of hazards in the workplace

The ideal way to prevent occupational diseases is to eliminate the hazards in the work environment, e.g. adopting work processes without generating hazards. Without hazards in the work environment, employees will not suffer from occupational diseases.

For example:

1. In compliance with relevant legislation, prohibition of asbestos spraying or the use of any type of asbestos insulation materials for the purpose of thermal, acoustic or other insulation can prevent employees from contracting asbestos-related diseases such as asbestosis and mesothelioma through inhalation of asbestos during the work processes.



2. Avoiding hand-dug caisson work which exposes employees to exceptionally high concentration of silica dust can minimise employees' risk of contracting silicosis.





(B) Substitution by alternative materials, tools or machines

If it is not possible to avoid work processes with health hazards, use safer alternative materials, tools or machines as far as practicable to minimise adverse health effects on the employees.

For example:

1. Substituting fibreglass for asbestos prevents employees from contracting asbestos-related diseases.



Asbestos



Fibreglass



2. Using toluene instead of benzene as solvent can minimise the risk of contracting leukaemia due to benzene exposure. Substituting water-soluble cleansing agents for organic solvents can reduce dermatitis among employees.



3. Replace sand containing a high level of free silica with metal shots in sand-blasting processes to prevent employees from contracting silicosis.



4. Substituting low-noise machines for noisy ones can reduce employees' risk of suffering from occupational deafness.

5. Using mechanical aids such as food mixer can save employees from repetitive upper limb movements and forceful exertions, thus preventing them from having musculoskeletal disorders.





(C) Engineering control measures

If the hazards in the work environment cannot be completely eliminated or substituted by using safer alternative materials, tools or machines, other control measures should be used to reduce employees' exposure to such hazards. Controlling the hazards by engineering methods is a widely adopted preventive measure. Engineering control measures include:

I. Enclosure

Enclosure of the hazardous work processes can reduce employees' exposure to the hazards and minimise the adverse health effects.

For example:

1. Enclosing the process of rock crushing in a quarry can prevent employees from contracting silicosis via inhalation of silica dust.



2. Using enclosed machines for disinfecting endoscopes can prevent employees from developing occupational asthma due to inhalation of glutaraldehyde.



II. Isolation

Employees should be isolated from hazards or work processes which cause hazards. Automation or remote control of operation may be used where necessary to minimise employees' exposure to the hazards.

For example:

1. When removing materials or plants containing asbestos, isolation of the removal area to minimise the spread of asbestos in air can prevent employees from contracting asbestosis and mesothelioma.



2. Using insulating materials to isolate heat sources such as hot water pipes or steam pipes in kitchens or cabins can lower the ambient temperature of the workplace to prevent employees from contracting heat-related illnesses.
3. Providing noise barriers can lower the noise level in workplaces nearby and mitigate the risk of employees suffering from occupational deafness.
4. Isolating infectious patients (e.g. those with avian influenza) in appropriate isolation wards can control the spread of pathogenic micro-organisms to prevent healthcare workers from being infected.



III. Wet method

Hazards such as dusts or fibres in the air can be reduced by water spraying to lower employees' risk of inhaling these substances in air.

For example:

1. Spraying water in construction sites when vehicles pass through to reduce the suspension of silica dust in air can protect employees from contracting silicosis.



2. Using wet wiping method properly in construction and demolition works can suppress asbestos dust production to prevent workers from contracting asbestosis and mesothelioma.

IV. Good ventilation system

To safeguard employees' health, a good ventilation system keeps indoor air fresh and helps extract harmful substances from the work environment. Ventilation in the workplace can be effected by natural or mechanical means. Mechanical ventilation usually relies on mechanical equipment to draw air into or out of a workplace. If the substances are rather hazardous or their sources are localised, supplementary local exhaust ventilation should be used to ensure that such substances are effectively eliminated or reduced to a reasonable level in the work environment.

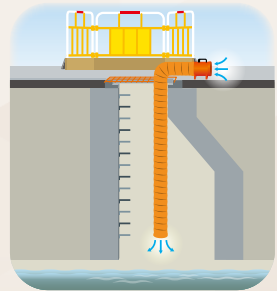
For example:

1. The negative pressure ventilation system adopted in isolation wards for infectious patients can prevent the spread of pathogenic micro-organisms and protect healthcare workers and other patients outside the isolation wards from being infected.



2. Installing local exhaust systems at appropriate locations in kitchens to extract hot air and steam outside can lower the temperature and humidity therein and help protect employees from heat-related illnesses.

3. Using exhaust fans to extract toxic gases inside pipes and blowers to supply fresh air in confined spaces such as underground pipes can help prevent accidents caused by toxic gas inhalation or oxygen deficiency.



4. Placing the exhaust hood of a local exhaust system near the fume-producing source during welding processes can minimise employees' risk of poisoning by inhalation of hazardous fumes.





(D) Administrative measures

I. Formulation, provision and monitoring of safety management system and guidelines

Employers from different industries should formulate a safety management system and a set of guidelines having regard to the nature of work in their respective industries. They should clearly explain the contents of guidelines and details of the operating procedures to employees to ensure that the employees understand the proper safe operating procedures and their importance. Regular monitoring should also be carried out to ensure employees' strict implementation of the guidelines to safeguard their safety and health.

For example:

1. Formulating and implementing operating procedures for the transport, storage, use, disposal and spillage of chemicals can reduce accidents arising from handling of chemicals and prevent employees from sustaining injury or being poisoned.
2. Laying down infection control guidelines and codes of practice and ensuring employees' compliance can reduce employees' risk of contracting infectious diseases such as hepatitis B, tuberculosis and SARS.



3. Formulating and implementing proper manual handling operation procedures and team lifting guidelines can prevent workers from developing tenosynovitis of the hand or forearm due to improper manual handling.

II. Provision of appropriate tools and mechanical aids

Provision of suitable tools and mechanical aids can minimise employees' physical effort at work and enhance their productivity, thus achieving a win-win situation for both employers and employees.

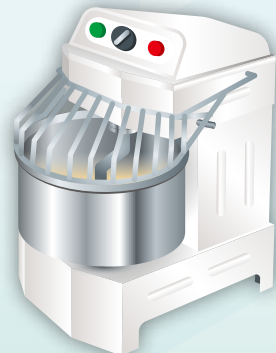
For example:

1. Use appropriate working platform or other appropriate assistive aids to reduce the distance of the goods from the body when handling goods at height can avoid overstretching the upper limbs and prevent musculoskeletal disorders.



2. Using tools such as hand pumps and pipettes to transfer chemicals can reduce direct skin contact with irritating chemicals to minimise the risk of dermatitis.

3. Using tools like mincers, mixers and can openers to reduce forceful and repetitive wrist and forearm movements of employees at work can prevent them from developing tenosynovitis of the hand or forearm.



III. Regular repair and maintenance

Different tools, equipment, machines, ventilation systems and protective gears are frequently used in various workplaces. Regular repair and maintenance can ensure proper functions of these facilities to safeguard the occupational health of employees.

For example:

1. Regular repair and maintenance of assistive devices such as trolleys and hand tools can prevent the devices from malfunctioning, and thus minimising employees' risk of musculoskeletal disorders due to forceful exertions and repetitive movements.
2. Regular repair and maintenance of the fume cupboards and local exhaust systems in autopsy rooms can ensure their efficiency and effectiveness in avoiding leakage of harmful chemicals (e.g. formaldehyde used for preservation), thus preventing employees from contracting diseases like occupational asthma.
3. Tightening loose parts and applying lubricants regularly can ensure the best performance of the machines to reduce noise caused by mechanical vibration or friction and help prevent occupational deafness among employees.



IV. Job rotation and appropriate rest breaks

Rotating employees to different work positions as far as practicable can reduce their prolonged contact with work hazards in a particular work position. Arranging appropriate rest breaks for employees to recuperate can also safeguard their safety and health at workplace.

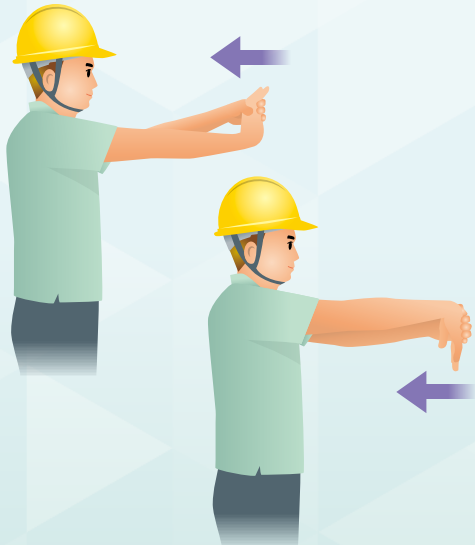
For example:

1. Rotating employees to work alternatively in noisy and quiet work environment can reduce their exposure to excessive noise and minimise the risk of hearing damage by noise.

2. Allowing employees who are required to work in a hot environment to take suitable rest breaks or rotating them to work in cool and shaded areas can prevent them from getting heat-related illnesses.



3. Rotating workers engaged in physically demanding tasks (e.g. construction workers) or workers engaged in work involving repetitive movements of the upper limbs (e.g. cleansing workers) to other work positions, or providing rest breaks for them to perform relaxation and stretching exercises can reduce their risk of having musculoskeletal disorders.



V. Provision of information and training

Providing necessary information and training to employees helps them understand the hazards at work and the appropriate preventive measures. If employees understand the importance of occupational safety and health, they will be more proactive in implementing such measures to prevent occupational diseases.

For example:

1. Employees working in noisy areas should know the adverse health effects of noise and the relevant preventive measures to help reduce their risk of getting occupational deafness.



2. Employers should provide employees with information on the chemicals used at workplaces, such as Safety Data Sheets (SDS), so that the employees know the properties of the chemicals, effects on their health and the safety precautions required for preventing them from getting diseases like dermatitis and occupational asthma, and chemical poisoning.

3. Employees working in elderly homes should be familiar with the infection control guidelines and universal precautions, and should receive proper training in the use of masks and other personal protective equipment to reduce the risk of occupational infections.



4. Educating workers in catering industry and meat processing workers the possible infections arising from the course of their work (e.g. *Streptococcus suis* infection) and the proper ways of managing wounds can reduce the risk of contracting occupational infections.

VI. Formulation of contingency plan

Every organisation should formulate a contingency plan according to its operational needs and conduct drills regularly so that employees can properly react in a timely manner to minimise the impacts of the incidents in case of emergencies.

For example:

1. Formulating evacuation/rescue plans for emergency situations such as chemical leakage in factories, leakage of radioactive substances in laboratories and suspected hazardous gas exposure in confined spaces, etc., can help employees handle the accidents properly and mitigate the risk of getting injured or poisoned by harmful substances.



2. In case of infectious disease outbreak in hostels, healthcare workers should follow the relevant contingency plan in handling the situation to avoid being infected.



(E) Personal protective equipment

Although controlling hazards at source is an ideal way to prevent occupational diseases, the use of appropriate personal protective equipment (PPE) will be the last resort if different control measures cannot eliminate or reduce the hazards to meet relevant standards. PPE should be used to complement other control measures since PPE alone is not sufficient for safeguarding the health of employees. When using PPE, one should pay attention to the correct way of wearing such equipment, regular checking of its effectiveness, cleanliness and hygiene as well as proper storage after use.

For example:

1. By wearing ear plugs or ear muffs, construction site workers can reduce the adverse effects of noise on their hearing while at work.
2. By wearing goggles or using face shields, welders can prevent keratoconjunctivitis caused by direct sight of ultraviolet rays.
3. By wearing gloves, cleansing workers can prevent direct contact of their hands with chemicals like bleaching solutions, multi-purpose disinfectants or toilet detergents, etc., for the prevention of occupational dermatitis.
4. Health care workers should wear surgical masks when attending to patients with respiratory infections to reduce the risk of contracting infectious diseases.



5. Workers in catering industry and meat processing workers should wear cut-resistant gloves when cutting meat to reduce the risk of contracting *Streptococcus suis* infection caused by cuts.



(F) Environmental monitoring

Environmental monitoring not only indicates the levels of hazards in the work environment but also reflects the effectiveness of existing control measures. If the level of hazards exceeds the relevant standards, then the health of employees working in or near such environment may be at risk. Therefore, regular environmental monitoring is an important step for preventing occupational diseases.

For example:

1. Before any work in a confined space, employers should appoint a "competent person" to conduct risk assessments and air monitoring to reduce or control the risk of such work to employees. Employers should conduct continuous air monitoring, if necessary, for early detection of the release of any harmful substances and their concentrations in air so that appropriate response can be taken to protect workers from gas poisoning.



2. Regular monitoring of the noise level at workplaces is an important part of a hearing conservation program. If the noise level is found to exceed the standard, both employers and employees should adopt corresponding preventive measures to mitigate the risk of contracting occupational deafness.



3. Taking air samples regularly in firing ranges for lead analysis can help prevent lead poisoning among employees.



(G) Health surveillance

Health surveillance is important for early detection of any deviance in employees' health due to work, so that they can seek appropriate treatment as early as possible and take corresponding preventive measures at the workplace.

For example:

1. Employees engaged in mines, quarries or compressed air work should undergo statutory pre-employment and periodic medical examinations and receive chest X-ray examination if necessary to prevent silicosis and compressed air illnesses, etc.



2. Employees exposed to ionising radiation at work (e.g. radiographers) should undergo statutory pre-employment and periodic medical examinations and blood tests for early detection of health problems caused by ionising radiation, e.g. leukaemia, dermatitis.



3. Employees may breathe in dusts containing cadmium during the production of cadmium batteries. Regular medical examinations can help detect early signs and symptoms to prevent cadmium poisoning.



(H) Personal hygiene and vaccination

Personal hygiene is very important in the prevention of occupational diseases. Employees should follow relevant working guidelines, and refrain from eating, drinking or smoking at the workplace, and should wash their hands thoroughly after work and before eating to avoid chemicals, bacteria or other harmful substances from getting into the body through eating and drinking. Furthermore, abrasions or cut wounds should be managed immediately to reduce the risk of contracting occupational infections while certain types of infections can be prevented by vaccinations.

For example:

1. To avoid lead dusts from getting into the body through eating and drinking, workers of soldering material production should not eat, drink or smoke at the workplace. They should also wash their hands thoroughly after work and before eating and drinking.
2. Workers in catering industry and meat processing workers should manage abrasions or cut wounds immediately to reduce the risk of contracting *Streptococcus suis* infection.



3. Health care workers should receive influenza vaccination annually to reduce the risk of being infected at work.



(I) Healthy lifestyle

Employees should adopt a healthy lifestyle to maintain a strong physique to meet the needs of their daily work activities. A healthy lifestyle includes adequate rest and sleep, a balanced diet, regular exercise, a cheerful mind, and abstinence from alcohol and smoking, etc.

1. Adequate rest and sleep can relieve fatigue and allow the body to recuperate so that employees have adequate energy to deal with daily work.



2. A balanced diet can maintain an ideal body weight and prevent excessive stress on the back and joints due to overweight. It can also enhance body resistance to diseases.

3. Regular physical activity improves cardio-pulmonary function and reduces the risk of developing many chronic diseases. It helps to maintain an optimum body weight and healthy bones, muscles and joints to prevent musculoskeletal disorders.



4. Use self-relaxation to relieve work stress and maintain a cheerful mind, and seek assistance from colleagues or supervisors when there are problems at work.

5. Abstain from smoking and alcohol, as smoking can increase the risk of occupational diseases such as Legionnaires' disease.

Conclusion

In general, early signs and symptoms of occupational diseases may not be apparent. Employees may therefore neglect them and delay treatment. When the condition deteriorates, treatment will become more difficult and complete recovery remote, affecting employees' productivity and causing death in serious cases. Occupational diseases will not only bring distress to employees and their families, but will also affect employers as having employees with occupational diseases will lower staff productivity and morale and may adversely affect corporate image. Prevention is better than cure. Employers and employees should therefore work hand in hand by adopting the above hierarchy of control measures to prevent occupational diseases at source to safeguard the health of employees.



Enquiries

If you wish to enquire about this booklet or require advice on occupational safety and health (OSH) matters, please contact the Occupational Safety and Health Branch of the Labour Department (LD) through:

Telephone: 2852 4041 or
2559 2297 (auto-recording service available outside office hours)

Fax: 2581 2049

E-mail: enquiry@labour.gov.hk

Information on the services offered by the LD and on major labour legislation is also available on our website at <https://www.labour.gov.hk>. For details on the services offered by the Occupational Safety and Health Council, please call 2739 9000.



Labour Department's
Website

Occupational Health Clinics of the Labour Department

Any worker who may have contracted work-related illnesses can call or visit the Occupational Health Clinics for appointment booking. Doctor's referral is not required.

- Kwun Tong Occupational Health Clinic Telephone: 2343 7133
- Fanling Occupational Health Clinic Telephone: 3543 5701



Occupational Health
Clinics

Complaints

If you have any complaints about unsafe operations and environments at workplaces, please call the LD's OSH complaint hotline at 2542 2172 or fill out and submit an online OSH complaint form on our website. All complaints will be treated in the strictest confidence.



Online OSH
Complaint Form



This booklet is issued free of charge and can be obtained from offices of the Occupational Health Service or downloaded from the Labour Department's website at https://www.labour.gov.hk/eng/public/content2_9.htm. For enquiries on addresses and telephone numbers of the offices, please visit the Labour Department's website at <https://www.labour.gov.hk/eng/tele/osh.htm> or call 2852 4041.



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