

## **MODULE ONE:**

### **Developing an Occupational Health and Safety Management System for Health Care Facilities**

The health sector is of extraordinary socioeconomic importance in the Americas. It is a huge source of employment that provides jobs for more than 12 million workers in the United States and 10 million in Latin America and the Caribbean (LAC) (PAHO estimates for 1999). Brazil alone employs more than one million persons in its health services (Brazil, Ministry of Health, 2003). It is important to note that most health workers are women, who suffer not only those risks directly tied to their work in the health sector, but also bear the burden that arises from gender inequalities.

Several health sector reforms have been introduced in Latin America and the Caribbean in the last decade, but they have not considered work conditions as a priority. The labor market in the health sector has moved toward more flexible models, which has redefined work processes, increased job instability, and, in most cases, decreased financial compensation (1). For example, nurses report that they need to hold two or three jobs to be able support their families. They also say that new health care models require them to perform more work in a shorter time and with fewer staff, that they care for populations that are sicker, and that they do so under greater restrictions in terms of supplies, equipment, and services in the facilities where they work (2).

Substandard working conditions in health care facilities have led to a shortage of trained professionals (3, 4), with serious consequences in health service outcomes. For example, a shortage of nurses in the United States has disproportionately affected developing countries whose professionals leave their land in search of higher salaries and better opportunities. This instantly leads to erosion in operational capacity, poorer performance, and lower productivity in health care facilities in the developing countries (5, 6).

Health workers are particularly vulnerable to occupational accidents and illness when they work in understaffed units and under precarious working conditions thus creating a vicious cycle. Studies in 11 United States cities have shown that nurses working in facilities with a high prevalence of AIDS patients report three times more needle-puncture injuries when they work in undersupplied and understaffed units that have lower nursing leadership and higher levels of emotional exhaustion (7).

Furthermore, technological advances in the health sector are far outstripping the development of procedures that ensure occupational and environmental safety (8). In the United States, occupational-accident rates among health workers rose in the 1990s. In contrast, that country's agriculture and construction sectors, which traditionally have been two of the most dangerous, are safer today than in the 1990s. In Latin American and Caribbean countries, where there is less available data than in the United States, the situation may very well be worse for several reasons, including:

- nonexistent, weak, or non-representative labor unions;
- a high prevalence of preexisting illnesses in the workforce, which increases the vulnerability to exposure to toxic and biological substances;
- a higher workload;
- a higher proportion of the health sector is privately funded (about 54% in 1994); this figure is higher than it is elsewhere in the world, except for South Asia;
- infrastructure and equipment tend to be ergonomically inadequate and hazardous;
- the elevation, temperature, and humidity levels in some countries may contribute to develop physical and biological risk factors; and
- qualified professionals in occupational medicine and safety are scarce. As anywhere else, general practitioners are not trained to identify occupational problems.

The cost of occupational injuries and illnesses goes well beyond the directly observable expenditures for treatment, rehabilitation, and pensions. It has been estimated that the indirect costs (absenteeism, loss of productivity, overtime pay) are between two and four times greater than direct costs (10).

Furthermore, it has been demonstrated that deficient occupational health and safety management results in errors that may be subject to legal suits for negligence and incompetence, both against the health services and the health workers themselves (11). Clearly, the development of a management system for occupational health and safety will help improve the quality of health care provided and decrease the risk of legal suits.

Patient safety and the output quality of health care have been consistently linked to the personnel providing the care and to the characteristics of the organization (12, 13). This linkage underscores the extraordinary importance of the human component in the administration of health care systems (14).

#### **Adequate management of workers' health and safety ensures:**

- **a decrease in absenteeism due to illness and lowered costs in health care and social security;**
- **healthy and motivated employees;**
- **better cooperation, organization, and harmony in the workplace;**
- **an increase in productivity; and**
- **better health care provided.**

**ADDITIONAL INFORMATION:**

(PORTUGUESE)

Portaria 37 -proposta de texto de criação da Norma Regulamentadora No. 32 –

Segurança e Saúde no Trabalho em Estabelecimentos de Assistência a Saúde.  
<http://www.mte.gov.br/Temas/SegSau/Conteudo/941.pdf>

Ministério de Saúde do Brasil – Anuário estatístico 2001 –  
<http://portal.saude.gov.br/saude/aplicacoes/anuario2001/index.cfm>

(SPANISH)

NTP 472: Aspectos económicos de la prevención de riesgos laborales: caso práctico  
[http://www.mtas.es/insht/ntp/ntp\\_472.htm](http://www.mtas.es/insht/ntp/ntp_472.htm)

NTP 540: Costos de los accidentes de trabajo: procedimiento de evaluación  
[http://www.mtas.es/insht/ntp/ntp\\_540.htm](http://www.mtas.es/insht/ntp/ntp_540.htm)

## MODULE TWO:

### Basic Concepts of Occupational Health and Safety Management

*The employer should have overall responsibility for the protection of workers' safety and health, and provide leadership for occupational safety and health activities in the organization.*

—From “Guidelines on Occupational Safety and Health Management Systems” ILO-OSH 2001

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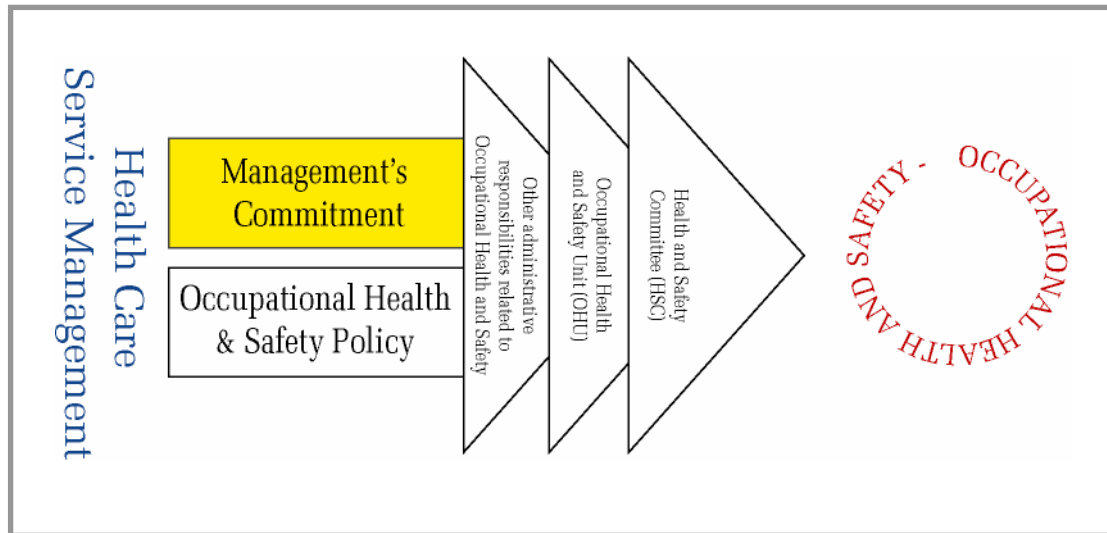
*There already are model programs that improve health and decrease costs. It is not knowledge that is lacking, but penetration of those programs into a greater number of settings.*

—From J Fries et al. New Engl J Med.1993; 239:321-325.



Health Care  
Service Management

## 2.1 MANAGEMENT'S COMMITMENT



The most effective strategy for managing health and safety in the health services and for providing health care is to incorporate occupational health and safety into an institution's managerial objectives. Handling health and safety objectives in the same way that objectives dealing with finances, the services, or quality are handled will help attain a high performance standard in health and safety.

It is management's responsibility to ensure that the health care facility under its responsibility establishes adequate policies and programs supplied with sufficient human and financial resources to provide a healthy and safe workplace.

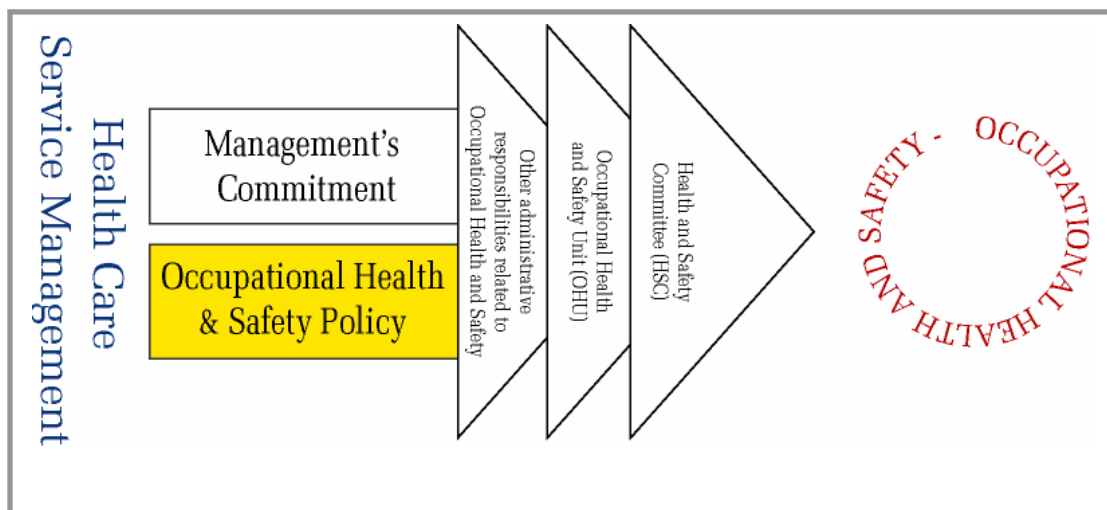
If necessary, one or more persons from top management should be given the responsibility, authority, and duty to collaborate with workers' representatives to:

- develop, apply, and periodically monitor and evaluate the occupational health and safety management system;
- periodically report on the operation of the occupational health and safety management system to the highest management level; and
- promote the participation of all members of the organization.

The extent to which employee activities are channeled toward a common goal depends on the extent of the administration's commitment and participation. In addition to directed activities carried out by the director or by persons specifically assigned to the health care facility's occupational health and safety management system, other top-management actions (in various areas) will demonstrate the support of the leaders to the management of occupational health and safety. For example:

- conduct regular worksite visits to communicate with workers and identify deficiencies to be resolved;
- promote and participate in regular meetings specifically held to discuss safety and health issues or introduce the discussion of these issues in regular daily meetings;
- observe if and how workers adopt work routines that could have serious consequences and set up a dialogue to discuss alternative ways of performing work;
- show an interest in the causes of occupational accidents and in how they have been taken care of. After an accident, assure workers that management cares for them, especially while victims are recovering;
- serve as an example by using personal protective equipment in work areas that require it and always respect existing prevention standards;
- adopt a participatory leadership and heed the opinions of the members of the organization as a way to establish the necessary confidence;
- establish and foster an organizational structure that supports activities of the risk prevention and risk control programs; and
- secure the necessary financial and human resources to ensure that the occupational health and safety system functions well.

## 2.2 OCCUPATIONAL HEALTH AND SAFETY POLICY FOR THE HEALTH SERVICES

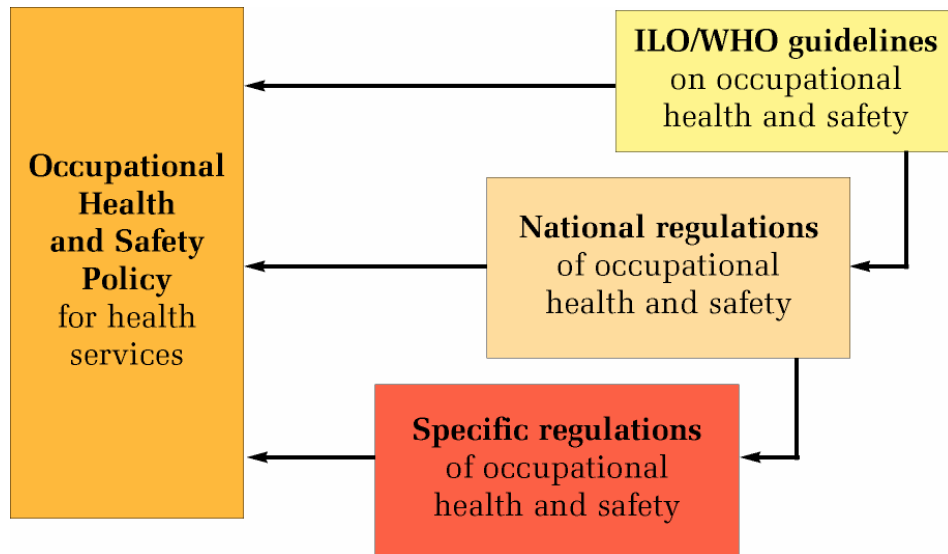


In order to provide a foundation for its health and safety management system, each health care facility should formulate a concise and clear statement of its institutional policy explaining how management intends to fulfill its commitment to worker safety and health. Tool 1, for example, presents a component of the occupational health and safety policy of a health care facility that deals with health care provided to employees.

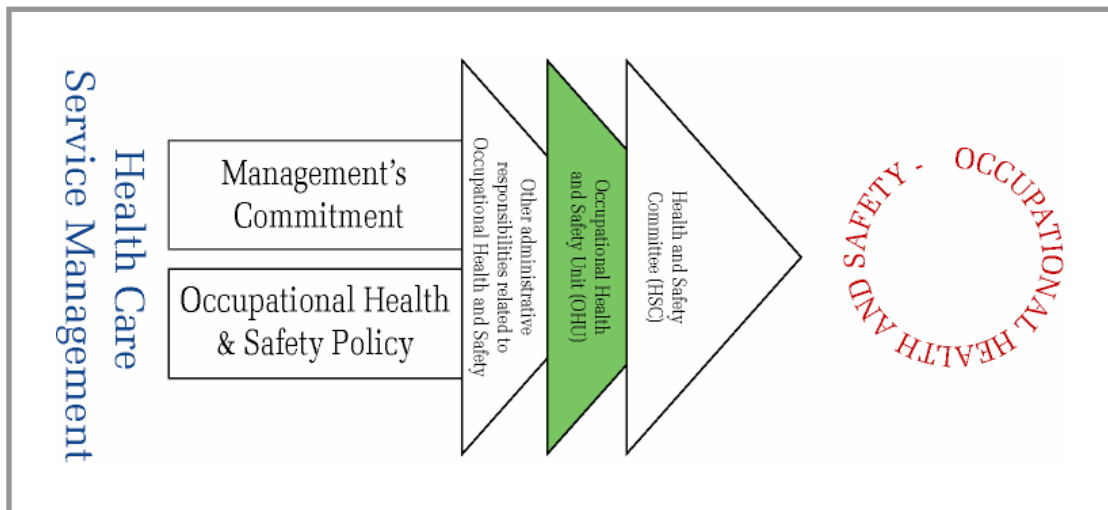
**Institutional Policy:**

- The institution's policy must be clear and presented in writing, stating the organization's commitment to the health and safety of its workers.
- The policy should outline the responsibilities and accountability of managers and supervisors at all levels. It should specify who is responsible for what and what arrangements are in place for identifying, assessing, and dealing with hazards and risks. Health and safety responsibilities should be incorporated into each job description and should be part of the employees' performance evaluation. A health and safety coordinator or an occupational health unit can help counsel managers thus helping to attain specific health and safety goals.
- The institution's policy should contemplate establishing an occupational health unit to work towards attaining specific health and security goals. In small establishments, a designated health-and-security coordinator can assist managers to attain the goals. (Also see the section following entitled, "Occupational Health and Safety Unit").
- A Health and Safety Committee should be established composed of worker and management representatives included in the health and safety unit. The Committee serves as an executive and advisory entity of the occupational health and safety management system and conducts ongoing, efficient, and direct activities. (Also see the section following entitled, "Occupational Health and Safety Committee.")
- The policy should be developed through a consultative process between management and workers or their representatives authorized by the highest management level.
- The policy should be effectively communicated to workers.
- A clear mechanism should be established and it should be evaluated periodically to ensure that the policy is duly updated.
- The policy should cover all staff, as well as patients, visitors and anyone else who comes in contact with services provided.

- The policy must be developed in line with international guidelines (on which this Manual is based), national legislation on occupational health and safety, and establishment’s specific facility regulations (see the following Figure below.)<sup>1</sup>



### 2.3 OCCUPATIONAL HEALTH AND SAFETY UNIT (OHSU)



<sup>1</sup> This Manual is intended to be used in all PAHO member states, but it is impossible to present here every country’s national legislation. To get this information, please consult the Internet web links and the documents of the ministries of labor and of health of the country where the specific health service facility is located.



In order to ensure effective management of occupational health and safety, the administration should foster the establishment and development of an Occupational Health and Safety Unit (OHSU).<sup>2</sup>

In consultation and collaboration with workers and management through the Occupational Health and Safety Committee, the Unit should coordinate activities to ensure compliance of the following four basic functions:

- monitoring of the work environment;
- surveillance of employees' health;
- advisory services and communication (providing information, education, training, and counseling on occupational health and safety to management and employees); and
- health care, such as first aid, collaboration with health authorities, and health programs (vaccination, etc.).

Although the Occupational Health and Safety Unit primarily has a preventive function, it may also be charged with dispensing medical treatment to workers and their families, as determined by national legislation and local needs.

Depending on the size of the health establishment and the particular needs of its workers, the Occupational Health and Safety Unit may be comprised of a group of professionals or by a single member.

If national laws permit, an Occupational Health and Safety Unit may serve a group of health care facilities in a given geographical area provided that this does not impede the staff member from carrying out duties in his or her establishment and taking into consideration the requirements of the work itself.

### **Professionals who Constitute an Occupational Health and Safety Unit:**

An Occupational Health and Safety Unit is best staffed with specialized professionals. If none are available, existing professionals should undergo special training. A multidisciplinary team is a priority (occupational medicine, occupational hygiene, ergonomics, occupational nursing, etc.).

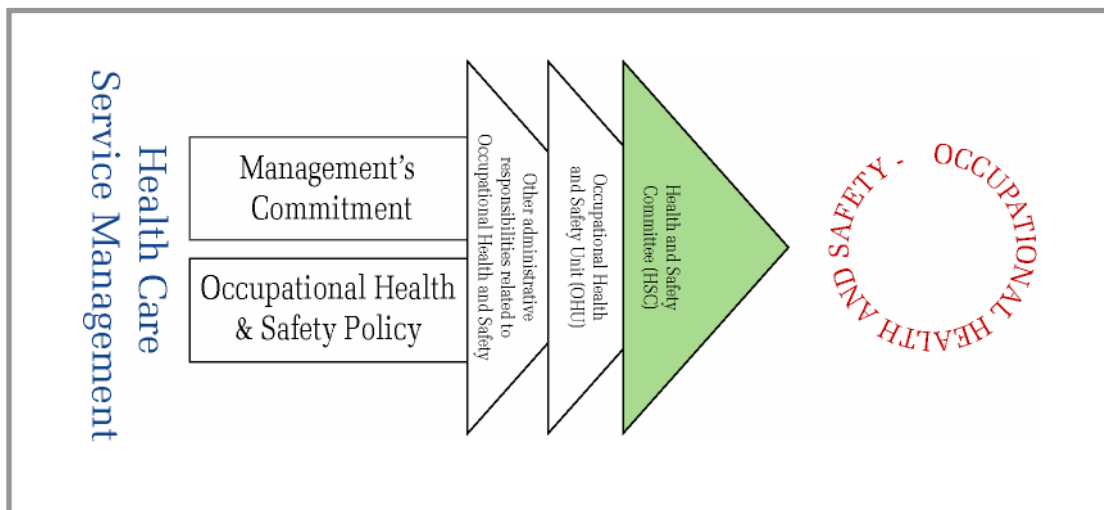
<sup>2</sup> The legislation and the web provide alternative terms: Serviços de Saúde no Trabalho (ILO Brazil), Servicio de salud en el trabajo (ILO in Spanish), Occupational Health Services (ILO in English), Basic Occupational Health Service (BOHS, more recent documents of ILO/WHO). Since this Manual addresses persons employed in health services, we avoid the use of the term “service” to refer to the medical and social assistance offered to the employee in order not to confuse between in-house services and services offered to the community.

### Some Requirements for the Proper Functioning of the Occupational Health and Safety Unit

- The Occupational Health and Safety Unit must have adequate space to carry out its activities and so its staff can perform its administrative functions.
- The professional independence of the Unit's members must be safeguarded in accordance with national laws and with standards agreed upon between management and workers.
- The Unit's professionals must adhere to confidentiality standards concerning information they receive on employees while performing their functions. Professional confidentiality is subject to exceptions defined in the legislation and in national regulations.

The items in the section “Strategies of Occupational Health and Safety” mention the role of the Occupational Health and Safety Unit in accomplishing occupational health and safety strategies. See also ILO recommendations concerning establishing an Occupational Health and Safety unit in the tool section of this Manual (Tools 2 and 3).

## 2.4 OCCUPATIONAL HEALTH AND SAFETY COMMITTEE



The Occupational Health and Safety Committee is an extraordinarily important tool in the management of occupational health and safety. It is a permanent group composed of representatives of employees and the employer who communicate and collaborate to identify and solve health and safety problems at the workplace, providing orientation and support to the occupational health and safety unit.

The Committee is charged with issuing recommendations to solve occupational health and safety problems, but is not responsible for implementing those recommendations. The ultimate responsibility for guaranteeing worker safety rests with the employer; in other words, the management or administration of the health care facility. The Committee may collaborate in implementing the recommendations, provided that management has established favorable conditions for the collaboration to occur (clear delegation of responsibilities, training, support personnel, etc.).

If the number of workers in the health care establishment is small, alternative arrangements may need to be made or the establishment may resort to pertinent technical norms. Thus, a small primary health care unit with fewer than ten workers probably will not be able to establish a committee. In that case, one of the workers may be designated as a health and safety representative. This worker would be the focal point for all occupational health and safety situations and matters. The worker may also represent his or her establishment and its workers in a health and safety committee made up of representatives from primary health care establishments from other health systems or from other geographical areas.

### **What Does the Occupational Health and Safety Committee Do?**

The committee's activities to promote a safer and healthier working environment are the following:

- promote occupational health and safety in the workplace in order to increase awareness and interest in them;
- respond to workers' health and safety concerns;
- help solve occupational health and safety problems;
- participate in hazard awareness campaigns;
- promote worker attendance at training and orientation sessions;
- review safe work practices;
- help select tools, equipment, and personal protection equipment;
- participate in worksite inspections to identify hazards;
- review accident and illness reports to identify their causes and prevent their recurrence; and
- develop safety policies and procedures that are secure and realistic; and

- establish links with other committees such as the infection control committee.

## **Benefits of a Productive Occupational Health and Safety Committee**

**1. Accident reduction.** Time lost due to accidents will decrease. Additional expenses such as funds paid for overtime, retraining, and compensation to other workers who stopped working or helped the accident victim also will be cut down.

**2. Prevention of occupational diseases.** The adoption of adequate preventative measures to protect workers can prevent the acute effects of hazardous chemical substances such as headaches, dizziness, nausea, disorientation, intoxication, and dermatological problems. Long-term, chronic effects such as cancer, respiratory diseases and neurological damage also can be prevented.

**3. Morale boost in the workforce.** This comes about as a result of the committee's calling of attention to the needs and improvements in health and safety issues and providing a communication channel for every worker to ensure that his or her concerns will be taken care of. Workers see results and can verify that the employer is genuinely interested in eliminating hazards. The worker then views his or her workplace as cleaner, more orderly, and pleasant.

**4. Damage reduction.** The causes of damage to materials and equipment are, by and large, the same as those of damage to the worker's physical integrity. Both imply high costs to the establishment—human costs due to the damage to the person and financial costs to repair or replace equipment or material.

**5. Productivity optimization.** Time lost due to equipment failure or poor work practices will be avoided.

**6. Reduction of material loss.** Losses often result from precarious work processes that can be controlled by health and safety practices.

## **How to Establish and Develop the Health and Safety Committee**

National legislation regulating the composition of the Health and Safety Committee may already exist. If no national norms are in place, it is recommended that a minimum of four members be designated, at least half of whom should represent workers and the remainder, the employer. It may be useful to add a fifth member elected by both parties to facilitate decision making. Worker representatives should be elected by their colleagues for a predetermined term and with a guarantee of job security unless they are found to have committed a serious misconduct.

Training of Occupational Health and Safety Committee members is a must. Copies of all legislation relating to workers' health policies and their procedures, as well as

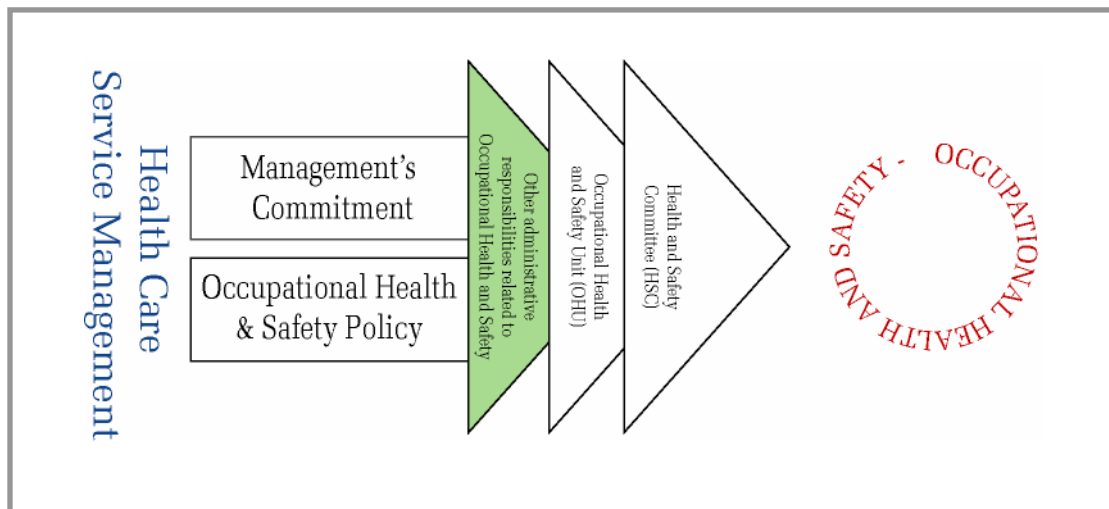
information on workplace alerts and hazards, must be sent to committee representatives. Outgoing members should brief new members.

The Committee should hold regular meetings with management. Workers and the administration must be equally represented at the meetings, or worker representatives should be the majority. Regular joint meetings of the Committee and management are necessary. Representatives should receive standard compensation for the time they spend on their functions and attendance at committee meetings.

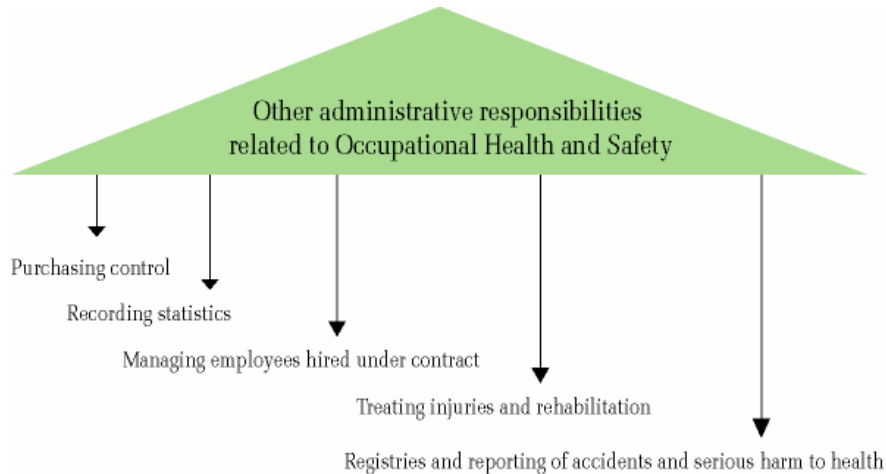
To ensure that the Committee functions effectively, assistance can be requested from such institutions as ministries of labor or of health, the PAHO/WHO Country Office, and the International Labor Organization (ILO). These institutions may have useful posters, booklets, films, and guides. There may also be courses offered for members interested in improving the Committee's efficiency.

The last section of this Manual provides useful tools (Tools 4, 5, 6, 7 and 8) to assist in establishing and maintaining the Occupational Health and Safety Committee.

## 2.5 ADDITIONAL ADMINISTRATIVE RESPONSIBILITIES RELATED TO THE OCCUPATIONAL HEALTH AND SAFETY UNIT



As a way to reinforce the occupational safety and health system, management should create administrative systems or adapt existing ones so that they include occupational health and safety components. This will strengthen the interface between the Occupational Health and Safety Unit and the administration of the health services, which will be adjusted to coordinate responsibilities for achieving occupational health and safety goals.



### 2.5.1 Purchasing Control

Management's responsibilities concerning the occupational health and safety of its staff members include dealing with those who design and manufacture products such as machinery, equipment, substances, and protective clothing. It is essential that purchasing regulations consider health and safety. The administration should have the support of the Health and Safety Committee in these matters, so that all potential risks and the costs of implementing controls are considered before any equipment, products, or services are introduced into the workplace.

A purchasing system should require that suppliers and vendors comply with the health care facility's specific health and safety standards as well as with all pertinent industrial standards norms. The suppliers and vendors should provide written information (such as technical information on the safety of materials) on the health and safety of all their products, chemicals or substances. Advice and training should be provided to all those responsible for any acquisition.

### 2.5.2 Managing Employees Hired Under Contract

In a health care service, the responsibilities of management, self-employed workers, employees, supervisors, and contractors (those who contract persons who are not employed by the health care facility) must be clearly defined.

Management is responsible for applying all practical measures to ensure that persons hired as staff, contractors, subcontractors, as well as any other persons who happen to be in the area, are not injured while the contracted work is performed. This does not absolve the contractor or subcontractor from his or her responsibilities as employer.

There may be many different types of work performed under contract at the same health care facility including long-term contract work (i.e., laboratory services that are

performed by private providers) and short-term contract work (i.e., nursing professionals contracted to cover a specific period).

The health care establishment should develop adequate administrative and procedural policies to deal with contractors and subcontractors in order to arrange their responsibilities to management and ensure that all subcontracted work complies with expected standards.

Large organizations with long-term contract arrangements should establish formal systems and negotiate compliance with health and safety requirements as part of the contracting process.

The coordination among contractors, those contracted, local management, and the health care facility's employees should be negotiated when contracts are determined for construction or maintenance projects as these jobs may generate hazards such as noise or solvent vapors that could affect patients and health care personnel.

The contractor should present the administration with a health and a safety management plan, stating the following:

- compliance with workers' health and safety standards and other pertinent regulations and codes of conduct;
- a system for identifying new and existing hazards for the duration of the contract and a plan to control serious hazards;
- health and safety information and training for contract workers;
- roles and responsibilities (a flow diagram would be useful);
- an employee supervision system, wherever necessary; and
- pertinent procedures to report and investigate accidents and incidents that may occur during the course of the contract work and procedures to advise management of said accidents and incidents.

Before contract work can begin, the establishment must ensure that all contractors are fully aware of the health and safety procedures applicable at the worksite.

This should include the following:

- information on any known health hazard contract workers may be exposed to at the worksite and ways to control those hazards;
- established emergency procedures to be adhered to in the event of an emergency; and

- observation of all instructions, warnings, and restricted areas.

### **2.5.3 Registries and Reporting of Accidents and Serious Harm to Health**

Management should maintain registries of work-related accidents and of serious harm to health. Registries should record all accidents that cause injury (or could have caused injury, such as exposure to body fluids of a patient). Registries and reporting should cover the following persons:

- (a) any employee at the workplace,
- (b) any person at the workplace who is under the employer's control.

Employers also should investigate, jointly with employees, every accident, injury, or risk of injury to determine whether it was caused by a significant hazard and propose changes to prevent the recurrence of another incident.

Employers should immediately report all serious injury to an employee during his or her work to the appropriate governmental office. Depending on the country's legislation, a reporting form may also need to be filled out.

If the injury is serious, the accident scene must not be disturbed, except to:

- save lives or avoid suffering;
- maintain public access to essential services, such as electricity or gas; or
- prevent severe damage or loss of property.

The responsible governmental office may want to investigate the accident and may dictate actions that should be undertaken in the meantime.

### **2.5.4 Treatment of Injuries and Rehabilitation**

A comprehensive health and safety management system integrates rehabilitation with prevention strategies.

The goal of a rehabilitation program is to promote an injured employee's return to work as quickly as possible. The program should therefore be designed, run, and overseen so as to ensure that the recovery process is maintained and the risk for further illness and injury is eliminated.



Human Resources management should work closely with the Occupational Health and Safety Unit during the reincorporation of employees whose illnesses or injuries require rehabilitation and gradual reintroduction to work.

If its structure permits, management may assume responsibility for the administrative and financial components (authorizations, pensions, etc.) and delegate responsibility for the medical and rehabilitation components to the Occupational Health and Safety Unit through the Employee Assistance Program (EAP).

Most employees will require only basic medical treatment for their injuries and illnesses and will return to work after short-term assistance without the need for formal rehabilitation. Injuries or illnesses that have caused serious harm or have required a long absence from work, however, will require more involved assistance procedures before recovery and a return to work can occur. (Also see sections “Occupational Health and Safety” and “Health Care, Rehabilitation, and Reintegration” found in this chapter.)

These procedures may include the following:

- early measures necessary for notification, intervention, and evaluation;
- clearly defined responsibilities within the rehabilitation program (e.g., the appointment of a rehabilitation coordinator);
- a multidisciplinary rehabilitation process;
- an established system so that the injured person, those in the workplace whose work has been affected by the injured party’s absence, and health professionals can communicate with one another;
- a system for monitoring recovery and coordinating the recovery with rehabilitation;
- follow-up after the employee returns to work; and
- a system for identifying alternative work duties.

Initiation programs for new employees should clearly explain the rehabilitation policy, ensuring that the process is well understood.

Needle injury episodes call for urgent action. Tool 18 at the end of the Manual’s last section includes a form to be used when reporting wounds caused by sharp objects. The form could be used as part of a program for monitoring biological risks (Also see the section “Biological and Infectious Risks” in the next chapter.)

## **Investigation**

It is important that all occupational illnesses and injuries be fully investigated, so that:

- the real causes can be identified;
- effective methods to prevent similar occurrences in the future can be developed; and
- national health and safety legislation requirements can be met.

### **2.5.5 Registries and Statistics**

Registries and statistics are extremely important tools (see Tools 20 and 21 in the last section of this Manual). They can be used:

- to compile and analyze data on the causes of injuries and illnesses so that specific control measures can be adopted;
- to identify particular work situations such as sites, departments, and tasks (for example, lifting of heavy loads) associated with high risk of injury or disease, in order to target prevention efforts;
- to provide concrete information for employees, management, and Health and Safety Committee representatives so they can objectively evaluate health and safety programs; and
- to evaluate progress and efficacy of injury and accident prevention efforts.

Management should ensure that information included in registries and reports be summarized and disseminated periodically (such as in monthly and annual reports; see Tool 21). This information should be used to steer the institution's occupational health and safety management system.

Monthly summaries should be prepared without delay (for example, within 30 days) after the end of each month and as the data become available. The monthly occurrence history can be analyzed for adopting necessary preventive measures. Typically, a monthly report presents monthly totals, cumulative data (for example, over the preceding 12 months), and necessary information needed to calculate injury and illness rates and trends.

Annual summaries of work-related occurrences showing cumulative totals of the previous year should be prepared without delay at the end of the year (for example, within 30 days).

## **2.6 PROCEDURES FOR MANAGING OCCUPATIONAL HEALTH AND SAFETY**

An occupational health and safety management system is inherently cyclic and participatory in providing continual feedback as it searches for information and improvement. This system is implemented in two phases: the first establishes the conditions so that the system can be created (initial steps) and the second allows the participatory and feedback features to clarify the system and procedures (ongoing improvement).

It is up to management to initiate the process if possible by consulting with existing occupational health and safety entities in the institution. The first steps may include the search for information to validate the decision to establish an occupational health and safety management system at the facility. (References at the end of Module 2 are useful for conducting a cost-effectiveness study in this regard.)

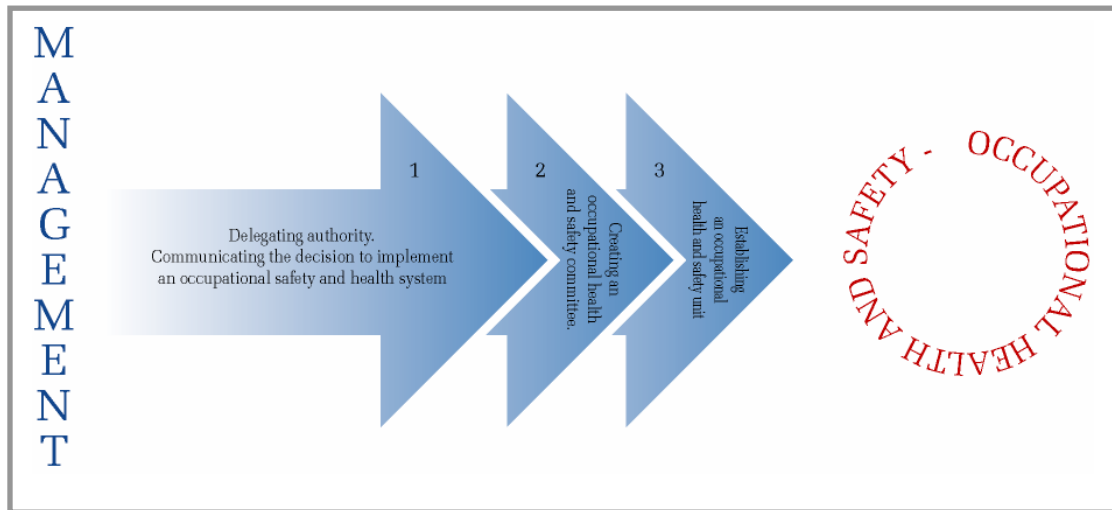
### **2.6.1 First Steps**

Management may already be sufficiently committed to implement or improve an occupational health and safety system. If so, the next goal should be to inventory all existing structures and practices in the establishment that deal with occupational health and safety (hospital infections committee, disaster management, vaccination routines, etc.). Tool 9 in the last Section presents a checklist that can be adapted and applied for this purpose.

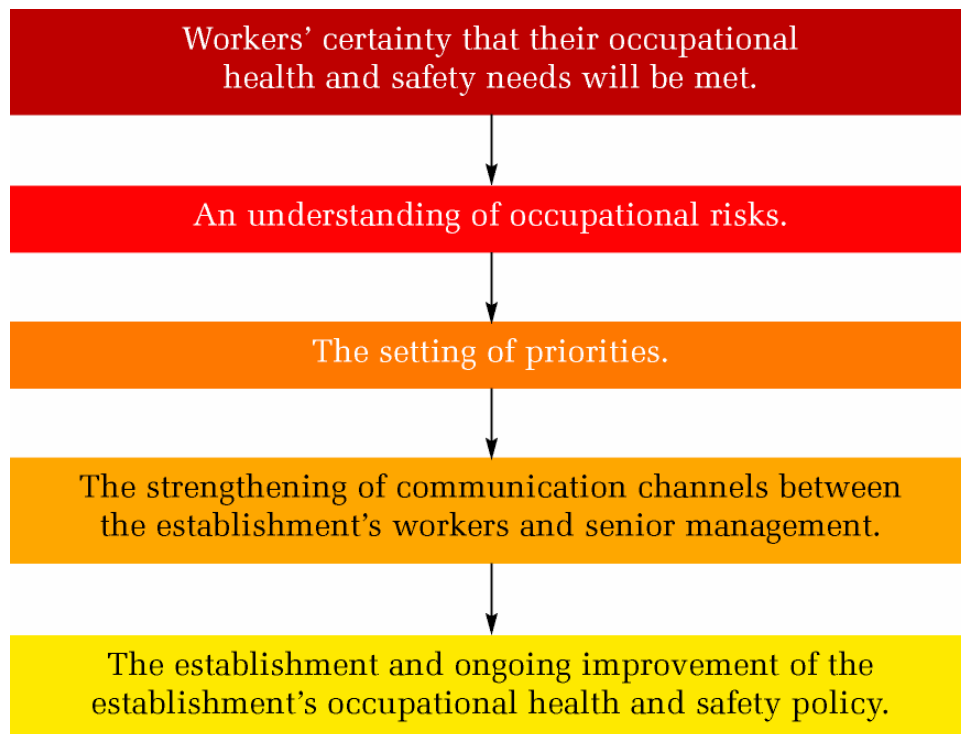
Initial-stage inventories, planning, and actions may be undertaken by the director or management may delegate, and duly authorize, the responsibility to an employee, an existing occupational health and safety entity, or a consulting firm specifically hired to that end. Two actions are required: the delegation of authority and the communication to all employees of the decision to establish (or improve) an occupational health and safety management system.

The initial phase should end in the establishment of a system's minimal structure, which should always be in compliance with regulations issued by ILO/WHO and national bodies, as well as in consideration of local conditions. The minimal structure should include the following:

- an Occupational Health and Safety Committee (also see section “Occupational Health and Safety Committee” earlier in this chapter) and
- an Occupational Health and Safety Unit (see section “Occupational Health and Safety Unit” that appears earlier in this chapter) or mechanisms for tapping into the Occupational Health and Safety Unit that covers all health care facilities in the geographical area or a group of health care facilities.



The occupational health and safety management system will begin to fully operate only after the Health and Safety Committee and Unit have been implemented. With the implementation of these two entities, the system has the minimal structure to begin the cycle of self examination and improvement of the health services in terms of occupational health and safety. The structure will reinforce the following:



## 2.6.2 Continued Improvements

This section will describe five essential processes for the ongoing operation of an occupational health and safety management system. These processes were included when the initial steps were undertaken. Now, with the system's minimal structure in place, these activities should become routine and should occur continuously.

These processes need not follow a prescribed sequence. Their order will depend on the system's level of development and current needs.



### Dialogue or Consultation

Dialogue, or consultation, should be inherent in good management and administration. It is the means through which employers and workers can work together to improve health and safety in the workplace. When changes in the workplace are being planned, consultation should take place as early as possible, and they should be ongoing.

Dialogue or consultation can lead to improvements in health and safety practice as workers become aware of the hazards in their work and suggest effective solutions. Employee involvement in identifying problems and in workplace changes also helps ensure worker commitment to the changes.

Dialogue or consultation includes:

- the development of policies, procedures, and plans of action for identifying, assessing, and controlling workplace hazards;
- the review of accident statistics;
- participation in solving problems;

- the involvement of senior management, workers, and the labor union;
- the consultation with workers or their representatives about major occupational safety and health concerns; and
- the guarantee that workers have access to all pertinent information and training on occupational health and safety.

There are several ways to consult with workers ranging from an exchange of ideas with supervisors, to discussions held in the committees, to the use of surveys. As an example, Tool 19 presents a survey form asking about workers' dietary habits and physical activity. The information gathered may be used to help design health promoting programs for workers and their families.

### **Planning**

In order to attain uniform occupational health and safety goals throughout the health service facility, each institution must develop an administrative plan. Planning is essential if a health care facility is to have consistent focus and maintain adequate environmental and working conditions.

Planning should:

- be conducted by competent persons in consultation with workers and/or their representatives;
- be based on a situation analysis. The results should be documented and should achieve the following five points:
  - identify the national and specific occupational health and safety legislation and directives in effect;
  - identify existing occupational health and safety practices, voluntary protection programs, and other initiatives already in place in the institution;
  - identify the most significant occupational risks and adapt the existing control mechanisms accordingly;
  - serve as the basis for developing an occupational health and safety management system; and
  - serve as a reference for the ongoing evaluation of the occupational health and safety management system.

- define clear objectives and establish quantifiable goals or standards that should be attained; and
- incorporate an action plan that sets task assignments and deadlines.

Planning also should consider the provision of adequate information and training for personnel at all levels so that the staff can assume their responsibilities.

### **Providing Information**

Employers should provide information to health care workers, patients, suppliers and to anyone in the community who uses the health care facility. This will ensure that the legal requirements in effect are known and that relevant and updated information is adequately provided on an ongoing basis regarding:

- all identified hazards;
- control of priority hazards (such as steps taken to control the likelihood that hazards could result in damage);
- the use and maintenance of personal protective equipment as necessary;
- any hazard workers may generate during work and the ways to control the likelihood of incurring harm to themselves or others;
- new hazardous processes, products, equipment and measures taken to control the likelihood of any associated damage;
- standards for work methods and practice;
- the health care facility's emergency procedures; and
- any means and procedures established through the occupational health and safety management system to ensure awareness by all so that the system is kept active and has the support of the workers.

There are many activities that can be used to disseminate information on health and safety. Recommendations include:

- the use of existing administrative and other staff meetings to provide and promote information on health and safety;
- development of new or modified job and duty descriptions;
- bulletin boards;

- inclusion in employee initiation training;
- supervisors' instructions to workers; and
- election of a health and safety representative for each work area.

The information should be presented in an appropriate format with consideration of employees' reading and writing level and language needs. It may be necessary to present and explain the information as well as verify the workers' understanding of the information they have received.

### **Visitor Information**

The system put in place should ensure that visitors (such as deliverers, volunteers, merchants, patient visitors, or inpatients) are aware of the health service facility's occupational health and safety requirements and comply by them.

Information should include:

- the facility's emergency procedures;
- the observance of, and strict compliance with, all instructions and precautions;
- the use of safety and warning signs in high-risk areas; and
- the banning of visitors from certain work areas where they might be affected by hazards or present a work hazard themselves.

### **Education and Training**

Employers should provide education and training in occupational health and safety for their workers as part of their responsibility to ensure a healthy and safe workplace. Employers should offer such training at all levels, including management, to ensure that the administration and workers can assume their responsibilities and to strengthen the culture of prevention of occupational health hazards at the facility.

Training in occupational health and safety should be integrated into the overall in-house training program. Occupational health and safety training should be periodically evaluated as part of the overall monitoring of the occupational health and safety program in order to ensure that all training needs regarding workplace hazards and their management have been identified and handled.

Workers' occupational health and safety training may be incorporated into:



- new employee initiation training (including training on workplace standards, occupational hazards and risks, controls, the use of personal protective equipment, accident notification system, and emergency procedures);
- job site training (handling of machinery, equipment, procedures, etc.);
- training of managers and supervisors (handling human resources and health care processes); and
- training of persons assigned to roles and responsibilities such as occupational health and safety coordinators and representatives, committee members, and emergency and first-aid responders.

A training record should be kept for each employee with data on acquired skills and competencies and any additional training that may be required. Training records should be updated regularly with the workers. (See also the section on “Fire Precautions” in Module 4.)

### **Supervision**

Employers should ensure that workers who do not yet have sufficient knowledge or experience to conduct their tasks and duties are supervised by an experienced worker until they can perform work without causing harm to his or herself or to others.

### **Audit and Review**

Health and safety audits and work performance reviews are the final steps of the health and safety management control cycle that effective organizations employ to maintain and improve risk management to the fullest extent. This process aims at ensuring coherent functioning and updating of the control mechanisms in relation to their intended goals.

Reviews should become part of all the facility’s occupational health and safety practices; auditing should be done periodically. Both should measure results such as the attainment of goals and objectives, trend analyses, and program efficacy. They also should be used to identify issues that require modifications to elements of the occupational health and safety program thereby improving the overall efficiency.

As a way to evaluate results, employees should be interviewed, tested, and observed at work to assess their understanding of health and safety policies, procedures, and training. Program effectiveness also may be evaluated by institution-wide and departmental trend statistics of occupational injuries and illnesses.

Auditing and review permit the policy to be evaluated according to the following four key indicators:

- attainment of set occupational health and safety performance standards;
- achievement of specific objectives of the action plan;
- identification of areas where standards are absent or inadequate so as to intervene immediately; and
- ongoing analysis of incident, accident and illness data.

Periodic audits should determine whether the occupational health and safety management system:

- is effective in terms of the health care facility's occupational health and safety policy and objectives;
- is effective in promoting full worker participation;
- responds to the conclusions of former reviews and audits;
- complies with national laws and regulations; and
- meets the goals of ongoing improvements and better occupational health and safety practices.

## 2.7 OCCUPATIONAL HEALTH AND SAFETY STRATEGIES

Occupational health and safety procedures may be organized along three main complementary strategies. A single strategy or a combination of these strategies can be used depending on the status of diseases and injuries that are targeted and on the local conditions.

Occupational Health and Safety Unit and Occupational Health and Safety Committee activities adhere to chosen occupational health and safety strategies.



## 2.7.1 Prevention of Injuries and Illnesses

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**This is probably the most widely used occupational health and safety strategy. It is based on the management of occupational hazards that may lead to injuries and diseases. It targets workplace risk factors that need to be identified, assessed, and controlled in order to prevent adverse health outcomes that have been selected for prevention.**

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This module sketches a broad concept of a system for the analysis and prevention of occupational risks. For a more applied treatment, consult Module 3, which presents the most frequent occupational hazards in the health sector and their preventive measures.

### Systems for Identifying, Evaluating, and Controlling Hazards

Occupational health and safety hazards and risks cannot be effectively identified, evaluated, or controlled unless the facility maintains a system for hazard identification, evaluation, and control. The system should be standardized for the entire health care facility to ensure that there will be no confusion about managing the occupational hazards and risks.

The occupational health and safety action plan should outline the details of the procedures that the personnel and administration must follow to identify, evaluate, and control hazards in their work environment.

It is important to conduct an inspection of the health care facility in order to make an initial diagnosis.

#### *A. Hazard Identification*

*Comprehensive hazard identification is the basis for the prevention of human or equipment damage or loss and interruption of processes.*

The initial hazard identification makes it possible to:

- identify pertinent and important hazards in the health care process;
- establish appropriate controls;
- define objectives for training and information needs;
- clearly define the responsibilities of management, supervisors, and workers; and

- draft and implement comprehensive work standards and integrated practices, including emergency procedures.

The methods of hazard identification include:

- area-specific identification based on the division of the workplace into identifiable areas. (Tool 10 shows a list of hazards that were identified by the site of their most frequent occurrence);
- task-specific identification of hazards by each step in the task;
- process-specific identification of hazards at each process stage; and
- job-specific identification of the hazards by stage in the process.

None of the above methods is unique or ideal for hazard identification. The preferred system depends on the type of services rendered, the processes involved, and the types of installations at the health care facility. A combination of methods may, therefore, be the best choice.

Tools 11 and 12 provide checklists for the identification of occupational hazards during a survey of the installations. The checklists may cover too much ground or may miss important aspects for the level of complexity of the workplace where they will be applied. They therefore need to be reviewed and adapted to the particular context where they will be used.

Existing resources—such as codes of practice and guidelines, health sector information booklets, information and specifications from medical supplies and equipment manufacturers, reports from inspectors or consultants, and environmental health reports—should be used to identify hazards. Registries of accidents, diseases, and absenteeism, as well as records of results of dialogue and consultations with workers are important sources of information.

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**A gender approach must be applied to the methods listed above because a person's sex may affect the effect of a given risk. For example, pregnant women may be particularly susceptible to radiation. Likewise, alternate shifts seem to affect women to a greater extent (e.g., menstrual dysfunctions,<sup>15</sup> greater alcohol and tobacco abuse.<sup>16</sup>)**

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### *B. Hazard Assessment*

As health hazards in the workplace are identified, decisions should be made to:

- immediately set up measures to control priority hazards or
- introduce control methods to reduce or eliminate the likelihood of injury from hazards that are not considered priorities.

Tool 14 in this Manual's last section provides a hazard-assessment worksheet designed to facilitate the decision making process.

### ***C. Hazard Control***

Hazards that have been identified and assessed as priorities require the employer to implement adequate control measures.

Control measures should follow the hierarchy described below, with a strong emphasis on eliminating hazards at the source, whenever possible.

- 1) Take all feasible measures to eliminate the hazard (for example, by substituting or modifying the process).
- 2) If elimination is impractical or remains incomplete, take all feasible measures to isolate the hazard (for example, instituting engineering controls such as insulating noise).
- 3) If it is totally impossible to eliminate or isolate the hazard, its likelihood to cause injury should be minimized. This effort should include:
  - ensuring that effective control measures are being applied, such as installing proper exhaust ventilation and providing personal protective clothing and equipment that is properly used and maintained, and
  - monitoring exposure among at-risk workers.

### ***D. Hazard Mapping***

“Hazard maps” for a given health facility are graphic and visual representations of occupational hazard data for that facility. Visual representation facilitates the identification, location, and assessment of hazards and yields a clearer understanding of the exposure that various groups of workers are subjected to.

Hazard maps should incorporate data collected with tools (Tools 10, 11 and 12) that were used to identify and quantify hazards.

Data may be presented for the establishment as a whole or for part of it. If a suitable floor plan is unavailable, a sketch of the overall architectural distribution or task distribution may be used to facilitate understanding and discussion.

This information should be systematic and easily updated. The process should not be viewed merely as a way to collect, organize, and analyze data.

The objectives of mapping are to:

- locate occupational hazards and risks and associated working conditions;
- understand conditions that may expose workers to existing occupational hazards; and
- understand measures adopted by establishment to control existing hazards in each task or area.

The methodology includes:

- 1) Elaborate work descriptions.
- 2) Develop a sketch of work areas.
- 3) Design inspection and hazard assessment manuals (tools presented here for the hazard identification and assessment may be adapted for this purpose).
- 4) Conduct relevant inspections followed by the identification of existing hazards by area or work process.
- 5) Point out the hazards that were identified and assessed.
- 6) Assess identified hazardous situations in order to seek and implement preventive measures to control the risk factors.

Mapping of the facility's various areas should present information through signs composed of:

- geometric forms (indicating information, precaution, prohibition, or warning);
- colors (indicating existing hazard, hazard in control phase, and hazard under control); and
- symbols or pictograms indicating the nature of the hazard.

Universal symbols facilitate understanding and should be used whenever feasible. It is recommended that signals that are similar to those used in signaling safety in the work areas be used in order to avoid misinterpretation.

Generating a map for each physical subdivision would be ideal. In special cases, specific maps may be prepared, depending on the complexity that of what needs to be represented.

Tool 13 in the last section of this Manual presents an example of a hazard map and signals that may be used in preparing maps.

## **Monitoring**

Monitoring refers to any evaluation or follow-up intended to establish the current condition of the workplace or the workers in terms of a hazard that has been determined to be a priority.

There are two major types of monitoring:

- environmental monitoring—an evaluation of the extent of a physical, chemical, or biological hazard or exposure at the workplace; and
- monitoring of workers or of worker exposure to physical, chemical, or biological hazards in the workplace.

For ethical reasons, informed consent is required of each worker before personal health monitoring is conducted. As with any medical records, monitoring records of workers must be kept confidential between the worker and the person that carried out the monitoring, unless the worker explicitly grants permission to have the results made available to the employer. The only results of biological monitoring that would normally be accessible to the employer are aggregate group results in which the identification of individuals has been obliterated.

## **Emergency Procedures**

A health care facility must be prepared to respond to a variety of emergencies—fires, riots, earthquakes, hurricanes, acts of terrorism, chemical accidents, etc.—and to take care of external clients, workers, and collaborators.

To this end, management should develop an emergency and disaster plan and conduct emergency simulations for all facility personnel so that the staff is fully prepared to react properly during emergencies or disasters. Every worker must know exactly what to do in every type of emergency. The police, fire departments, emergency services, and other authorities should be included in the emergency response plan.

Management is responsible for ensuring that such a program is instituted and that it is reviewed and updated frequently. All employees should be given the opportunity to fully

participate in the development of emergency procedures so that every health worker knows what to do in these emergencies.

At a minimum, the program must include:

- a corporate policy statement that emphasizes the importance of emergency response planning and affirms management's endorsement of the emergency response initiative;
- an outline of the chain of command or responsibility during an emergency that ensures rapid and effective response;
- clearly defined functions and responsibilities of all facility staff members during an emergency;
- a clearly defined communications network and warning system to be used during normal working hours and beyond;
- detailed emergency responses for every type of emergency;
- preparation and posting of emergency evacuation procedures and routes;
- procedures to be followed by workers who remain in charge of critical facility operations or are charged with shutting them down before the facility's evacuation;
- clearly defined early notification requirements establishing who is responsible for notifying within the organization and to external authorities about an incident ;
- training requirements for all staff in the facility; and
- regular reviews and updates of the emergency response plan.

The section "Registries and Reporting of Accidents and Serious Harm to Health" presented earlier in this module gives an overview of notification and registration of accidents and serious injuries.

### 2.7.2 Health Promotion

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**Health promotion has the widest perspective on workers' health, safety, and performance. It is a tool that can help to prevent injuries and illness by substituting risky situations and behaviors for less hazardous ones. Thus, in promoting healthy lifestyles, health promotion not only targets the working environment but also other health risks and protective factors in workers' lives.**

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Preparing health promotion materials and activities for the workplace may help prevent work-related injuries as well as encourage healthy practices and behaviors that could have a beneficial effect outside of the workplace (for example, a physical activity program can help offset some musculoskeletal risks).

Health promotion emphasizes the following aspects:

- an comprehensive focus with multidisciplinary collaboration and the establishment of a favorable environment in the workplace;
- responsibility for oneself and for others;
- prevention of illnesses and injuries;
- strengthening of overall health;
- participation and empowerment of workers; and
- equity and access.

Tool 19 in the Manual's final section presents a questionnaire that can be administered to workers to orient the design of health promotion programs.

### **Policy on the Consumption of Tobacco, Alcohol, and Psychoactive Substances in the Workplace**

Considering that several countries regulate these substances, it will be necessary to consult technical norms in force within the country to guide the programs concerning these substances and their use. At any rate, management, in consultation with workers, should develop a policy to cover the consumption of tobacco, alcohol, and psychoactive substances in the workplace.

The policy on smoking at the workplace (even if the country does not have standards in this regard) should be based on the principle that non-smoking workers should be totally protected from tobacco smoke in the workplace because there are no safe parameters on what constitutes a safe level of exposure to cigarettes in the environment. To this end, it will be necessary to incorporate a series of minimum restrictions in health care facilities, including a smoking ban:

- in elevators;
- when working with certain chemical products (for example, flammables), when performing certain tasks or processes, or when working in certain spaces (for example, entrances into confined spaces or where patients are being cared for);

- in offices where more than one person works; or
- in an enclosed space where air is shared.

The policy should focus on:

- communicating with employees (through clear policy, such as defining where smoking is permitted in outside areas);
- education (providing information that justifies the policy); and
- support for employees who wish to quit smoking (providing counseling and support groups as part of the institution's policy to help employees withdraw from tobacco).

Similar practices can be adopted to deal with the consumption of alcohol and other psychoactive substances. In countries where there are no specific regulations in this regard, policies at health care facilities should incorporate elements to prevent the use of these substances, not only because they may injure the health of the user, but also because of the danger they represent to the health care process, the installations, and other workers.

## **FURTHER INFORMATION**

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Work Research Centre: *A manual for Promoting Health Activity at Work*. Dublin, 1996.  
To request a list of publications, write to: Work Research Centre Ltd. 22 Northumberland Road, Ballsbridge, Dublin 4, Irlanda (fax: 353 1 6683142).

Wynne R. *A Manual for Training in Workplace Health Promotion*.  
Dublin, European Foundation for the Improvement of Living and Working Conditions, 1997.

Standards for Health Promotion in Health Promoting Hospitals  
[http://www.who.dk/healthpromohosp/Publications/20030127\\_7](http://www.who.dk/healthpromohosp/Publications/20030127_7)

Griffiths, JH: *A Practical Guide to Health Promotion in the Workplace: Guidelines for Alliance-building and Networking with Companies*. European Health Promotion Series, No. 5. Cardiff, World Health Organization, 1995.

(SPANISH)

Relatoria taller estrategia de promoción de la salud de los trabajadores en América Latina y el Caribe. Temas: empresas, centros y puestos de trabajo saludables - OPS/OMS - San José, Costa Rica, 2000. <http://www.cepis.ops-oms.org/bvsast/e/fulltext/relcosta/nexo5.html>

Estrategia de promoción de la salud en los lugares de trabajo de América Latina y el Caribe. OPS/OMS. <http://www.cepis.ops-oms.org/bvsast/e/fulltext/relcosta/anexo6.html>

### **2.7.3 Health Care, Rehabilitation and Reintegration to Work**

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**The emphasis should be on the care and rehabilitation of existing health problems with the aims of restoring the employee's physical and mental health, preventing recurrences, and facilitating the return to work.**

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Personal problems, including health concerns, may seriously affect work performance and result in less safe and less healthy work practices. This may endanger the worker, fellow workers, patients, clients, and other persons in the work area. The workplace should have a management system for these situations as soon as they emerge. This system is called the Employee Assistance Program (EAP).

Personal problems that may be dealt with by the Employee Assistance Program include:

- alcohol or drug dependency;
- financial difficulties;
- family difficulties;
- stress;
- bereavement;
- physical or mental health problems; and
- return to work and rehabilitation.

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**The primary objective of the Employee Assistance Program is to assist the worker in restoring his or her health and work performance to satisfactory levels. Care should be taken, however, not to let this become the main function of the specialist physician. In other words, the medical professional should not become so overwhelmed with triage consultations and prescribing rest that reduce his capacity for occupational health tasks.**

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The policy and practices of the Employee Assistance Program should be developed in consultation with the workers and adapted to local conditions.

It is a good idea for the Employee Assistance Program to become a component of the health care facility's Occupational Health and Safety Unit, or at least function in close communication with it (see the section "Occupational Health and Safety Unit" presented earlier in this module, the International Labor Organization's Convention 161, and Recommendation 171 on occupational health services in Tools 2 and 3 presented in this Manual's last section). This arrangement favors the use of the Occupational Health and Safety Unit's resources (e.g., its privileged communication with Human Resources' administrative areas, its medical knowledge of personnel, etc.) to manage cases and even to provide medical and psychosocial care in varying degrees of collaboration with other assistance units.

Depending on available resources and the legislation in force, the above collaboration may be extended to include professionals at the health care facility, the local health system, social security, the network of associated professionals and enterprises in legal or psychological services, etc.

It is essential that the staff members' medical care be integrated with the facility's other administrative units that deal with occupational health and safety (for example, those responsible for registries and statistics, administrative processes for acquisition of treatments, gradual return to original duties, etc.).

Referrals and other matters related to counseling and treatment of workers must conform to strict confidentiality and discretion requirements.

Tool 16 at the end of this Manual presents a medical form that may be adapted for use in the Employee Assistance Program.

## **FURTHER INFORMATION**

Tools for Cost-benefit Analysis of OH&S Management:

(traditional version) [www.cersso.org/mat\\_pmchtradicional](http://www.cersso.org/mat_pmchtradicional)

(electronic version) [www.cersso.org/mat\\_pmchherramientas.asp](http://www.cersso.org/mat_pmchherramientas.asp).

Download the software for epidemiological and statistical procedures (Epi Info™) at <http://epi.minsal.cl/epi/html/frames/frame1.htm>

Construction Safety:

"Medical facility Renovation". Garvey DJ et al. Professional Safety. PP 20-24. June 2001. American Society of Safety Engineers.

## Emergency Preparedness:

(Draft) Standard Guide for Hospital Preparedness. <http://www.astm.org/cgi-bin/SoftCart.exe/DATABASE.CART/WORKITEMS/WK4344.htm?L+mystore+uyjm6753>

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<http://www.ilo.org/ilolex/cgi-lex/convde.pl?R171>

Guide for the Design, Implementation, Evaluation, and Control of Occupational Safety and Health Programs. [http://www.cersso.org/en/mat\\_pmgst\\_e.asp](http://www.cersso.org/en/mat_pmgst_e.asp)

Joint occupational Safety and Health Committee:  
[http://www.worksafebc.com/publications/health\\_and\\_safety\\_information/by\\_topic/assets/pdf/jointoch.pdf](http://www.worksafebc.com/publications/health_and_safety_information/by_topic/assets/pdf/jointoch.pdf)

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[http://www.hchsa.on.ca/products/resrcdoc/lap\\_269.pdf](http://www.hchsa.on.ca/products/resrcdoc/lap_269.pdf)

Healthy Settings – Canadian Cases Studies, Health Canada.  
<http://www.hc-sc.gc.ca/hppb/ahi/pdf/healthysettings.pdf>

Joint Occupational Health & Safety Committee. Education and Development Section Prevention Division Workers' Compensation Board of British Columbia. 2000.  
[http://www.worksafebc.com/publications/health\\_and\\_safety\\_information/by\\_topic/assets/pdf/jointoch.pdf](http://www.worksafebc.com/publications/health_and_safety_information/by_topic/assets/pdf/jointoch.pdf)

(PORTUGUESE)

Portaria 37 - Proposta de texto de criação da Norma Regulamentadora N.º 32 – Segurança e Saúde no Trabalho em Estabelecimentos de Assistência à Saúde.

<http://www.mte.gov.br/Temas/SegSau/Conteudo/941.pdf>

#### CAMINHOS DA ANÁLISE DE ACIDENTES DO TRABALHO

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Esplanada dos Ministérios, Bloco F, Sala 147 – Ed. Anexo

Tels.: (0xx61) 317-6672/6671/6688; Fax: (0xx61) 224-3538

Ministerio da Saúde (2001) MANUAL BRASILEIRO DE ACREDITAÇÃO HOSPITALAR. Série A. N.117. 3a Edição.

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Guía para el Diseño, Implantación, Evaluación y Control de Programas de Seguridad y Salud en el Trabajo. [http://www.cersso.org/mat\\_pmgst.asp](http://www.cersso.org/mat_pmgst.asp)

Guía de Evaluación de los Riesgos Laborales del Instituto Nacional de Seguridad e Higiene en el Trabajo de España. <http://www.mtas.es/insht/practice/guias.htm>

Investigación de accidentes, método árbol de causas.

[http://www.mtas.es/insht/information/Ind\\_temntp.htm](http://www.mtas.es/insht/information/Ind_temntp.htm)

SAISO = Sistema de Vigilancia

<http://epi.minsal.cl/epi/html/frames/frame1.htm> y

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## MODULE THREE:

### Hazards, Their Potential Effects and Their Control

The occupational hazards to which health workers are exposed are well documented and generally fall into the following six basic categories:

- **Biological or infectious hazards.** These include infectious and biological agents such as bacteria, viruses, fungi, or parasites that may be transmitted through contact with contaminated material or with bodily fluids or secretions (examples of these hazards include the human immunodeficiency virus [HIV]; hepatitis B and C viruses; tuberculosis bacillus).
- **Environmental hazards.** An adequate water supply and a clean overall environment are basic for protecting workers and patients in a health care center as asepsis and cleanliness are required for successful medical interventions. Adequate natural or artificial ventilation is essential to combat many of the threats to workers' health such as the transmission of tuberculosis and the exposure to anesthetic gases. In addition, health care facilities generate contaminated water and hazardous solid waste that require proper treatment, processing, and disposal. Ignoring these hazards would put workers and the entire community at risk.
- **Physical hazards.** These hazards involve agents in the work environment such as radiation (X rays, laser, etc.), electricity, extreme temperatures, and noise that can cause tissue damage and other injury.
- **Chemical hazards.** These are various chemical substances that are toxic or irritating to the body system, including medications, solvents, and gases (for example, ethylene oxide, anesthetic gas wastes, glutaraldehyde).
- **Mechanical hazards.** These factors in the work environment increase or augment the risk of accidents, wounds, injury, or discomfort (e.g., poor lifting devices or inadequate equipment, slippery floors, etc.).
- **Psychosocial hazards.** These are factors and conditions associated with work tasks or working environments that cause or augment the risk of stress, emotional strain, and interpersonal problems (e.g., stress, work shifts).

This Manual contains modifications to the above classifications in order to emphasize various hazards particularly relevant to health workers which would otherwise be overlooked. Thus, hazardous waste management, ergonomic hazards, laboratory safety, and violence in the workplace were extracted from other classification categories to become hazard categories in their own right thereby increasing the number of categories in this module to 10.

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The order in which hazards are presented in this module is not ranked. The importance of each risk factor varies depending on the type of services provided and the characteristics of the health care facility such as size and location. However, the serious and widespread risk presented by bloodborne microorganisms (chiefly hepatitis B (HBV), hepatitis C (HCV), and human immunodeficiency virus (HIV)) calls for the urgent adoption of control measures.

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### **3.1 BIOLOGICAL AND INFECTIOUS HAZARDS**

Biological and infectious agents may be transmitted to a person through inhalation, injection, or by skin contact. Sources include patients, asymptomatic carriers, or vectors such as rats, cockroaches, and mosquitoes. The number of organisms in the environment, coupled with their virulence and a person's resistance to them, determine whether the person will contract the disease or not.

An infection control program should define the necessary policies, procedures, and practices in order to minimize the risk of disease occurrence and transmission at a health care facility. This requires that workers be consulted and that the effort is supported by all of management and staff.

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**It is important that the policy and the practice of infection control consider the characteristics and risks of infection for each establishment given that health care facilities vary widely in size, patient population, inpatients, and available resources.**

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#### **A. Responsibilities**

##### **Management Responsibilities**

The employer in a health care facility is responsible for providing adequate protection against infections and offering a safe working environment to all staff. At the end of this Manual, you will find references that provide further details on biological safety programs.

Any establishment that provides health services should define safe work practices within the context of hazard identification, assessment, and control. These practices should include:



- baseline monitoring of previous exposures (for example, hepatitis B immunity status, baseline Mantoux, etc.) as a part of recruitment;
- staff access to appropriate testing, vaccinations, and counseling;
- procedures for conducting biological monitoring of workers' health;
- procedures for reporting illnesses, accidents, and injuries and for conducting appropriate follow-up including the surveillance of occupational and work-related illness and accident occurrence (this is particularly important for the prevention of occupational HIV, hepatitis B, and hepatitis C). Tool 18 presents the EPINET form for registering cuts and needle punctures;
- reporting serious accidents to responsible governmental offices;
- educating and training staff on the principles, policies, and practices of infection control. This applies to all personnel including both those in support positions and clinical staff;
- the implementation of adequate controls including engineering controls such as appropriate ventilation systems (these are very important in the prevention of airborne transmission of infections such as tuberculosis). See links for further information at end of this chapter;
- standard work practices that improve safety (for example, infection control in the administration of injections, Tool 17);
- the provision of necessary personal protective equipment to protect workers' health (e.g., gloves for general precautionary measures, masks, clothing, etc.) and safety equipment to prevent puncture injuries from needles and other sharp objects (such as hard containers for the disposal of materials used during injections and surgery);
- regular monitoring of the work environment and work practices to assess compliance with infection control as part of the facility's occupational health and safety policy; and
- practices that ensure that "universal precautions" are implemented throughout the facility.

### **Worker Responsibilities**

All workers are responsible for taking every necessary step to protect their health and that of their workmates, patients, visitors and other users of the health care facility. These practices must be followed in order to ensure that the policies and practices of the facility's infection control program are implemented.

## B. Management of Biological Hazards

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**In general, Hepatitis B, hepatitis C, HIV, and tuberculosis are among the most important risks for health workers. In addition, many other microorganisms such as influenza, cytomegalovirus, etc. may present occupational hazards for health sector workers.**

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The policies and practices for controlling risks should cover all tasks and routines related to cleaning the facility overall as well as in specific areas such as isolation wards, operating rooms, patient-care equipment, and the handling of spills.

The following section deals with the most important issues related to the management of biological risks in health care facilities.

### Cleaning and Laundry Services

Laundry services also should have safe policies and procedures to collect, handle, store, and distribute linens to ensure that there is no risk of biological contamination. These procedures should cover handling contaminated items and clothing of persons known to be infected.

### Vaccinations

Because health workers are often exposed to, and have contact with, persons that are likely to be infected, these workers can be a significant source of transmission (such as transmission of measles to children). This makes it all the more important to have immunization programs in place.

Given the seriousness of hepatitis B, its high prevalence worldwide, and the availability of a highly effective preventative means through vaccination, it is important to implement hepatitis B immunization programs for each worker (17) including the often overlooked workers who collect waste.

Vaccination of workers against hepatitis B:

- should be implemented as early as possible;
- does not routinely require booster vaccines; and
- if possible, should be followed by a determination of antibody response 2–6 months following the last dose.

The following table shows the most highly recommended vaccinations for health care workers in general. This table serves as a guide that should be adapted to local epidemiological conditions and national legislation.

GENERIC NAME	ADMINISTRATION SCHEDULE	INDICATIONS	PRECAUTIONS AND CONTRAINDICATIONS	SPECIAL CONSIDERATIONS
<b>HEPATITIS B RECOMBINANT VACCINE</b>	Two doses IM in the deltoid muscle 4 wks apart (up to 2 months); 3 <sup>rd</sup> dose 5 mo. after 2 <sup>nd</sup> ; booster doses not necessary	Workers at risk of exposure to blood or bodily fluids	No apparent adverse effect on developing fetus; not contraindicated in pregnancy. Persons with history of anaphylactic reaction to common baker's yeast	No therapeutic or adverse effect in HBV-infected persons. Cost-effectiveness of pre-vaccination screening for susceptibility to HB virus depends on the cost of vaccination, antigen testing, and prevalence of immunity in the group of potential vaccinees; health workers that have ongoing contact with patients or blood should be tested 1-2 mo after completing the vaccination series to determine serological response
<b>INFLUENZA VACCINE (INACTIVATED WHOLE OR SPLIT VIRUS)</b>	Annual single-dose IM	Workers in contact with high-risk patients or working with chronic care installations; workers with high-risk medical condition and/or are $\geq 65$ yr	History of anaphylactic sensitivity to eggs	No evidence of maternal or fetal risk
<b>MEASLES LIVE-VIRUS VACCINE</b>	One dose SC, 2 <sup>nd</sup> at least 1 month later	Workers without documentation of (a) receipt of two doses of live vaccine on or after 1 <sup>st</sup> birthday (b) physician-diagnosed measles, or (c) laboratory evidence of immunity	Pregnancy; immuno-compromised state (including HIV-infected persons with severe immuno-suppression); history of anaphylactic reaction after gelatin or receipt of neomycin; or recent receipt of immune globulin	MMR is the vaccine of choice if recipients are also likely to be susceptible to rubella and/or mumps; persons vaccinated with (a) killed measles vaccine alone; (b) killed vaccine followed by live vaccine; or (c) a vaccine of unknown type should be revaccinated with two doses of live measles vaccine
<b>MUMPS LIVE-VIRUS VACCINE</b>	One dose SC, no booster	Workers considered susceptible can be vaccinated; adults born before 1957 can be considered immune	Pregnancy; immuno-compromised state; history of anaphylactic reaction after gelatin or receipt of neomycin	MMR is the vaccine of choice if recipients are also likely to be susceptible to measles and/or rubella
<b>RUBELLA LIVE-VIRUS VACCINE</b>	One dose SC, no booster	Workers of both sexes who lack documentation of receipt of live vaccine on or after their 1 <sup>st</sup> birthday or of laboratory evidence of immunity; adults born before 1957 can be considered immune, except women in childbearing age	Pregnancy; immuno-compromised state; history of anaphylactic reaction after gelatin or receipt of neomycin	Women pregnant when vaccinated or who became pregnant within 3 mo. of vaccination should be counseled on the theoretic risks to the fetus, the risk of rubella vaccine-associated malformations in these women is negligible; MMR is the vaccine of choice if recipients are also likely to be susceptible to measles and/or mumps
<b>CHICKENPOX-ZOSTER LIVE-VIRUS VACCINE</b>	Two 0.5 ml doses SC 4-8 wk apart if $\geq 13$ yr	Workers without reliable history of varicella or laboratory evidence of varicella immunity	PREGNANCY, immuno-compromised state; history of anaphylactic reaction after receipt of neomycin or gelatin; salicylate use should be avoided for 6 wk after vaccination	Because 71-93% of persons without a history of varicella are immune, serologic testing before vaccination may be cost-effective

## Universal Precautions and other Standard Precautions

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**“Universal precautions” are those that the entire health personnel apply to all outpatients and inpatients, regardless of their presumed infectious status. These precautions assume that the blood of any person (or any substance contaminated with blood) may be infectious. Precautions are required to reduce the risk of disease transmission from known or unidentified sources of infection.**

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Standard precautions combine the most important aspects of universal precautions (designed to reduce the risk of transmission of bloodborne pathogens) and the isolation of other bodily substances (designed to reduce the risk of transmission of pathogens from moist bodily substances). Standard precautions include, but are not limited to, handwashing, use of protective gloves, and use of barrier protection. These precautions are established according to the type of services dispensed, clientele, etc.

Websites with more detailed information on standard precautions by type of services are listed at the end of this chapter.

### Minimal Precautions

At a minimum, every health service should implement the following general precautions for its workers:

- 
- **Avoid contact with blood and all bodily fluids, secretions, and excretions except sweat (whether they contain blood or not), broken skin surfaces, and mucous tissue, by:**
    - **using gloves in operating rooms and elsewhere. Gloves should be doubled during surgical operations where extensive exposure to blood is expected;**
    - **using masks, face shields, protective eyewear, and gowns where spills or effusions may occur;**
    - **using waterproof bandages to cover the worker’s cuts and wounds;**
    - **immediately cleaning and decontaminating all spills, blood spots, and other bodily fluids;**

- **preventing injuries from sharp objects; not covering needles; using puncture-proof containers to dispose of used needles, etc**
  - **Provide rigorous training in the basic techniques for using sharp instruments**
  - **Combat fatigue by establishing rest periods**
  - **Establish an institutional approach for treating exposure to accidents**
- 

### **Treatment after Exposure**

The institution's approach to post-exposure treatment should include:

- a sustained educational campaign on hazardous exposure for the entire facility;
- a protocol on immediate exposure management made available in the work areas;
- post-exposure assistance within one hour;
- a protocol for handling questions on problems such as hepatitis B, syphilis, etc. (not HIV);
- antiretroviral agents that are immediately available;
- a protocol for examining the "source patient";
- availability of medical follow-up for those who decide to undergo antiretroviral chemotherapeutic prophylaxis;
- confidential medical registry of exposure; and
- serological follow-up of all involved patients.

The following table shows the norms that the United States Federal Government uses for the post-exposure prophylaxis to materials potentially contaminated with hepatitis B virus.

**Table: Recommended Post-exposure Prophylaxis for Exposure to Hepatitis B Virus**

Vaccination and antibody response status of exposed workers*	Treatment		
	Source HBsAg <sup>†</sup> Positive	Source HBsAg Negative	Source Unknown or Not Available for Testing
Unvaccinated	HBIG <sup>§</sup> x 1 and initiate HB vaccine series <sup>¶</sup>	Initiate HB vaccine series	Initiate HB vaccine series
Previously vaccinated Known Responder**	No treatment	No treatment	No treatment
Known Non-Responder <sup>††</sup>	HBIG x 1 and initiate revaccination or HBIG x 2 <sup>§§</sup>	No treatment	If the high risk source is known, treat as if source were HBsAg positive

\* Persons who have previously been infected with HBV are immune to reinfection and do not require post-exposure prophylaxis.

<sup>†</sup> Hepatitis B surface antigen

<sup>§</sup> Hepatitis B immune globulin; dose is 0.06 mL/kg intramuscularly.

<sup>¶</sup> Hepatitis B vaccine

\*\* A responder is a person with adequate levels of serum antibody to HBsAg (i.e., anti-HBs  $\geq 10$  mIU/mL).

<sup>††</sup> A nonresponder is a person with inadequate response to vaccination (i.e., serum anti-HBs  $< 10$  mIU/mL).

<sup>§§</sup> The option of giving one dose of HBIG and reinitiating the vaccine series is preferred for nonresponders who have not completed a second 3-dose vaccine series. For persons who previously completed a second vaccine series but failed to respond, two doses of HBIG are preferred.

<sup>¶¶</sup> Antibody to HBsAg

Source: "Updated U.S. Public Health Service Guidelines for the Management of Occupational Exposures to HBV, HCV, and HIV and Recommendations for Post-exposure Prophylaxis," MMWR, June 29, 2001, Vol. 50 (RR-11): 22

Several tools that can be used for managing biological risks are presented in the final section of this Manual. Tool 15 presents tables organizing the use of personal protective equipment by the task performed. After adaptation for local use, these tables may be kept in places where workers can consult them before beginning their respective tasks. Tool 17 provides WHO norms, including the most adequate practices for the control of infections when administering injections. Tool 18 is a form for registering wounds caused by needles or sharp objects (based on the EPINET surveillance system) that is widely used in many countries that have experience in occupational health and safety management.

## ADDITIONAL INFORMATION

GENERAL:

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Guideline for Infections Control in Healthcare Personnel, CDC, 1998. <http://www.cdc.gov/ncidod/hip/GUIDE/InfectControl98.pdf>

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CDC Small Pox, 2003. <http://www.bt.cdc.gov/agent/smallpox/index.asp>

Warning Signs on Infectious Transmissions for Healthcare Facilities, hchsa, Ontario, Canada. [http://www.hchsa.on.ca/products/resrcdoc/lap\\_010.pdf](http://www.hchsa.on.ca/products/resrcdoc/lap_010.pdf)

CDC Respiratory Protection , 2003. <http://www.cdc.gov/ncidod/sars/res-protection.htm>

(IAQ) Indoor Air Quality in Healthcare Facilities, HCHSA Ontario, Canada, 2003. [http://www.hchsa.on.ca/products/resrcdoc/lap\\_263.pdf](http://www.hchsa.on.ca/products/resrcdoc/lap_263.pdf)

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Precautions Against Bio Hazards (POSTERS). HCHSA Ontario. [http://www.hchsa.on.ca/products/resrcdoc/lap\\_010.pdf](http://www.hchsa.on.ca/products/resrcdoc/lap_010.pdf)

CDC. Hand Hygiene in Healthcare Settings. 2002. <http://www.cdc.gov/handhygiene/>

Developing Infection Control Policies & Procedures: Information for Care Providers. Health Care Health & Safety Association (HCHSA) of Ontario. [http://www.hchsa.on.ca/products/resrcdoc/lap\\_260.pdf](http://www.hchsa.on.ca/products/resrcdoc/lap_260.pdf)

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Site em português de Saúde Ocupacional no Setor de Saúde da União Européia [http://europe.osha.eu.int/good\\_practice/sector/healthcare/pt/](http://europe.osha.eu.int/good_practice/sector/healthcare/pt/)

Lavar as Mãos – informações para o profissional de saúde <http://www.cvs.saude.sp.gov.br/zip/lavar.zip>

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Patologia do Trabalho – 2ª edição . René Mendes. Atheneu. 2003

(SPANISH)

Manual Sub-regional de Normas de Bioseguridad para Laboratorios de Salud Pública. PAHO. 2001.

Vivir con los microbios. Universidad de Carabobo, Venezuela. Prof. Aismara Borges, Teléfono: 58-243-232-1001. Aismarab@telcel.net.ve

#### TUBERCULOSIS:

(ENGLISH)

WHO - Guidelines for the prevention of tuberculosis in health care facilities in resource-limited settings. WHOTB/99.269.

English version: <http://www.who.int/gtb/publications/healthcare/summary.html>

Protect Yourself Against Tuberculosis - A Respiratory Protection Guide for Health Care Workers. DHHS (NIOSH) Publication No. 96-102. 1995. <http://www.cdc.gov/niosh/tb.html>

Stop Tb: Guidelines for Workplace Tb Control. WHO. 2003

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Normas para la prevención de la transmisión de la tuberculosis en los establecimientos de asistencia sanitaria en condiciones de recursos limitados. OMS. 2002

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Summary of Current Practice Guidelines for Occupational exposures to Bloodborne Pathogens (HIV, Hep B, Hep C). Johns Hopkins. 2002.

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Exposure to Blood: What Health-Care Workers Need to Know. CDC

Updated U.S. Public Health Service Guidelines for the Management of Occupational Exposures to HBV, HCV, and HIV and Recommendations for Postexposure Prophylaxis. CDC. June 29, 2001 / 50(RR11); 1-42.

<http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5011a1.htm>

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Universal Precautions, Including Injection Safety. WHO.  
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Manual For Prevention Against Viral Bloodborne Pathogens. India. 1999.  
<http://www.ohscmbai.org/manuals/manhcwfr.htm>

Safer medical device Implementation in Healthcare Facilities.  
<http://www.cdc.gov/niosh/topics/bbp/safer/>

ANA Needlestick Injury and Bloodborne Pathogen page  
<http://nursingworld.org/needlestick/nshome.htm>

(SPANISH)

EPINet. Sistema para vigilancia de accidentes con riesgo biológico y prevención; permite cálculo de gastos [www.dso.fmed.edu.uy](http://www.dso.fmed.edu.uy)

OTHER:

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Severe Acute Respiratory Syndrome (SARS). <http://www.cdc.gov/ncidod/sars/>

Interim Domestic Guidance for Management of Exposures to Severe Acute Respiratory Syndrome (SARS) for Health-Care Settings, CDC, 2003.  
<http://www.cdc.gov/ncidod/sars/pdf/exposureguidance.pdf>  
<http://www.cdc.gov/ncidod/sars/exposureguidance.htm>

Drug-Resistant Organisms. Canadian Centre for Occupational Health and Safety.  
[http://www.ccohs.ca/oshanswers/biol\\_hazards/drugresist.html](http://www.ccohs.ca/oshanswers/biol_hazards/drugresist.html)

Sustainable Hospitals Web site (for safer alternatives) [http://www.sustainablehospitals.org/cgi-bin/DB\\_Index.cgi](http://www.sustainablehospitals.org/cgi-bin/DB_Index.cgi)

### **3.2 ENVIRONMENTAL HAZARDS**

Environmental hazards occur frequently in Latin American and Caribbean (LAC) health care facilities. Most of the time, these hazards are generated by:

- inadequate supply, distribution, and availability of water for human consumption;
- air quality problems in confined spaces that aggravate chemical and biological hazards; and
- improper handling of hazardous solid waste (this item will be treated in detail in the section entitled “Hazardous Solid Waste” found later in this chapter).

PAHO offers guidance on the use of appropriate technology for dealing with these environmental hazards.

### 3.2.1 Water Supply for Health Care Establishments

The principal hazards associated with water supply in health care establishments are:

- water scarcity due to low coverage of the water supply system, intermittent supply, or inadequate installations and maintenance at the health care facility;
- contamination of water supplies due to inadequate or nonexistent management, treatment, and protection of water sources by municipal authorities or contamination of the establishment’s water sources caused by improper discharge of wastewater; and
- environmental contamination of the buildings due to inadequate treatment of municipal wastewater. Only 14% of all Latin American and Caribbean (LAC) wastewater drainage networks lead to some kind of wastewater treatment and only half of those are sanitary.<sup>18</sup> This often results in the contamination of the entire surrounding area, making it necessary to treat the establishment’s wastewater before it leaves the premises because it contains infectious, radioactive, and laboratory subproducts and sterilizing agents.

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**The consequences of disregarding environmental hazards include a risk of infectious and parasitic diseases to workers and patients because necessary antiseptic routines cannot be maintained or harm to medical procedures such as hemodialysis that have strict norms for the water that is being used. The ecosystem and the entire population in the area may also be put at risk.**

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### 3.2.2 Air Quality Problems

Air quality problems in a health care facility are mainly due to:

- improper flooring material - the insufficient cleaning of floors may lead to infections and allergic conditions; excessive use of sterilizing agents are associated with neoplastic and reproductive diseases; and vinyl and latex spills are associated with allergies;
- air conditioning and ventilation problems - air flow should move from a less contaminated area toward a more contaminated one in order to protect workers against transmission of tuberculosis and inhalation of hazardous substances;
- laser fumes that may contain viruses, dead cells, and toxic gases that promote visual problems and cellular mutation;
- cigarette smoke from smoking workers or visitors;
- asbestos - this compound is often seen in heat-resistant laboratory gloves that begin to break down at high temperatures as well as in the insulating material used in chimneys and ceilings. It is a causal to lung, stomach, and brain cancer and tumors as well as other pulmonary problems; and
- lead-based paints - this has been linked to different forms of anemia, hypothyroidism, male reproductive problems and various renal, cardiac, and cerebral problems.

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American Institute of Architects (1996-1997) "Guidelines for Design and Construction of Hospital and Health Care Facilities". <http://www.tsi.com/hvac/tech/hosguide.htm>

City of Albuquerque Pollution Prevention. Free Educational Materials.

Biomedical Laboratories Code of Practice. <http://www.cabq.gov/p2/index2.html>

Dental Waste Guidelines. [http://www.cabq.gov/p2/Dental%20grant/dental\\_booklet.pdf](http://www.cabq.gov/p2/Dental%20grant/dental_booklet.pdf)

Health Care without Harm Publications:

Contact Jolie Patterson at [jpatterson@hcwh.org](mailto:jpatterson@hcwh.org) to receive free brochures

GEN-06 Green Birthdays

MER-02 Protecting by Degrees: What Hospitals Can Do to Reduce Mercury Pollution

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CEPIS (1996) Curso de Saneamento Ambiental Intrahospitalario.

Sansores RH & al. (2000) “Exposición pasiva al humo de tabaco en los Institutos Nacionales de Salud en México”. Rev Inst Nal Enf Resp Mex; 13(2) pp 96-100.

### 3.3 HAZARDOUS SOLID WASTE

Health care facilities produce large quantities of hazardous solid waste generated during various phases of medical care such as diagnoses, treatment, immunization, research, etc. These wastes are sources of infectious, neoplastic, and reproductive diseases.

In addition to common waste (administrative, foodstuffs, packing materials, etc.), there are other types of medical waste, such as:

- infectious waste, meaning waste that contains pathogens; and
- special wastes - corrosive, reactive, flammable, toxic, explosive, or radioactive materials.

The establishment that generates the waste should be responsible for ensuring its safe disposal through an environmental waste management policy that conforms with legal requirements. The procedure adopted should protect the health and safety of those in the facility and in the community.

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**In order to protect persons charged with waste disposal from risk of HIV or hepatitis, for example, through accidents involving contaminated sharp objects, solid waste disposal containers must be closed before they are completely filled to avoid accidents. In addition, refuse collectors should be given personal protective equipment (special gloves, etc.) and should be provided with training and vaccination against hepatitis B.**

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Policies for handling hazardous waste should be developed in consultation with the workers who generate and handle the waste and those who dispose of it. The chain of

responsibility, and the responsibilities at all levels of the organization, have to be identified as the policy is developed and implemented.

Waste management policies should cover the entire process, from the origin of the waste to its final destination. At a minimum, policies should cover:

- the identification of waste materials;
- a comparison between the benefits of using the materials and the problems linked to their disposal;
- preparation of a transport and disposal flowchart from the waste's point of origin to its final destination;
- clear assignment of responsibilities at each step in the process; and
- training of personnel on waste management procedures and hazards .

It is unclear which practices are best for the final disposal of institutional solid waste. Controversies include economic and organizational factors and the environmental risks of incinerators, among others. The safest strategies involve minimizing waste, which can be attained by separating waste; working on source reduction, recovery, and recycling; and properly treating and disposing of the waste.

## **FURTHER INFORMATION**

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WHO (1999) Safe Management of Wastes from Health-care Activities.

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Health Care without Harm Publications:

contact Jolie Patterson at [jpatterson@hcwh.org](mailto:jpatterson@hcwh.org) to receive free brochures

- GEN-06 Green Birthdays
- MWT-02 Medical Wastes Treatment Technologies: Evaluating Nonincineration Alternatives

- MWT-03 Non-Incineration Medical Waste Treatment Technologies

WASTE DISPOSAL AND WASTE REDUCTION, Case Western Reserve University 2003.  
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Prüss, A. and WK Townend, Teacher's Guide: Management of wastes from health-care facilities; WHO, 1998. [http://www.who.int/environmental\\_information/Healthcarewaste/guide1.pdf](http://www.who.int/environmental_information/Healthcarewaste/guide1.pdf)

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Gestión y Tratamiento de los Residuos Generados en los Centros de Atención de Salud  
<http://www.ccss.sa.cr/germed/gestamb/samb06b4.htm>

### **3.4 PHYSICAL HAZARDS**

Physical hazards that affect health workers include exposure to noise, vibration, ionizing and nonionizing radiation, and electricity. A systematic survey should be conducted in order to identify all possible hazards. For the purposes of identification, an inspection can be conducted during the installations with a properly trained person or a selected group representing the Health and Safety Committee following consultations with workers in each area. All hazards and potential risks should be identified and recorded.

Tools 11 and 12 in the final section of this Manual present two checklists that can aid in identifying occupational hazards, including physical hazards. These checklists can be used during an inspection of the installations.

After identifying hazards and their potential effects, risks should be assessed to establish which ones can cause serious harm (Tool 14). Once priority hazards have been identified, a series of steps ranked by importance should be implemented to eliminate, isolate or minimize these risks.

### 3.4.1 Noise

Exposure to excessive noise levels may cause hearing loss and annoyance. Excessive noise levels also can interfere with communication and lower performance.

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**Excessive noise levels may be encountered in various areas of a health care facility such as in workshops, laundry areas, and orthopedic units, as well as in areas where plaster casts are prepared. A preliminary assessment should be conducted to identify the areas where noise levels exceed or could exceed permissible exposure levels.**

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A more detailed assessment may be necessary in order to:

- determine noise levels to which workers are exposed;
- help identify sources of noise;
- develop noise control strategies; and
- determine the needs for hearing protection.

A clear hierarchy of controls should be adopted, making the control of risk due to noise through engineering controls the highest priority. When dealing with machinery or processes where engineering controls do not sufficiently reduce noise levels, exposure should be reduced by isolating workers from the noise. Personal noise protectors should be used continuously only when engineering controls and isolation are not feasible.

As new techniques are developed to control noise, management must stay on top of technological advances and be prepared to purchase the most effective equipment for noise reduction as it becomes available.

Many countries have specific noise-reduction regulations. In the United States, for example, the allowable limit for an eight-hour workday is 90 dBA. Hearing protection programs are mandatory for workers who work eight hours at an average level that exceeds 85 dBA. In Brazil, the law sets an 85 dBA limit for an eight-hour work day and requires the implementation of a hearing protection program.

#### **Hearing Protection Program**

Excessive noise can be controlled by introducing hearing preservation programs in the workplace. Such programs may include:

- identifying the risk of hearing loss in the workplace;
- assessing noise hazards;
- developing a noise abatement policy;
- implementing control measures;
- conducting periodic audiometric testing of all employees continually exposed to excessive noise;
- providing training in noise reduction and prevention;
- disseminating information to ensure that workers perform work tasks in a safe and healthy manner; and
- consulting with the workers at each step of the process.

## **FURTHER INFORMATION**

(ENGLISH)

New Zealand's OSH Publications:

Management of Noise at Work: Resource Kit, including

- Control Guide: Management of Noise at Work
- Approved Code of Practice for the Management of Noise in the Workplace
- List of Graded Hearing Protectors
- Fact Sheets and Employee Booklets

Noise-induced Hearing Loss of Occupational Origin: A Guide for Medical Practitioners

Noise-induced Hearing Loss - A Message to Employees on Preventing Hearing Loss

USA:

Recommended Guidelines for Controlling Noninfectious Health Hazards in Hospitals. 2002.  
<http://www.cdc.gov/niosh/hcwold5c.html>

Hearing Conservation Program, 2001. <http://www.cdc.gov/od/ohs/manual/mannav.htm>

(PORTUGUESE)

NORMA REGULAMENTADORA – NR7 E NR15. <http://www.mte.gov.br>



NBR 10152, INMETRO

Portaria 37 - proposta de texto de criação da Norma Regulamentadora N. ° 32 – Segurança e Saúde no Trabalho em Estabelecimentos de Assistência à Saúde.

<http://www.mte.gov.br/Temas/SegSau/Conteudo/941.pdf>

### 3.4.2 Vibration

Noise processes are often associated with vibration. Intense vibration may be transmitted to workers who drive vehicles or use hand-held equipment or tools. Workers may be exposed to vibration in different ways:

- whole body exposure, as while driving an ambulance; or
- partial or local body exposure, as while using vibrating tools such as drills in orthopedic rooms.

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**Exposure to whole body vibration is primarily associated with lumbar pain and early degeneration of the spine. Operators of hand-held vibrating tools have an increased risk of “white finger syndrome.” In addition, vibration can affect tendons, muscles, bones, joints, and the nervous system. As a whole, these effects are known as “hand-arm vibration syndrome.” Exposure to cold can aggravate hand symptoms.**

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Exposure should be controlled at all times and kept within limits that protect from adverse health effects. International standards and other documents contain recommendations for limits (for example, see ISO 2631 and ISO 5349). Obviously, the most effective control is to reduce vibration. This includes:

- ascertaining the vibration levels in a given tool or machinery before deciding to purchase it; wherever possible, low-vibration equipment should be chosen;
- considering whether the work can be done without high-vibration tools;
- using tools designed to minimize vibration;
- providing good maintenance of tools and equipment;
- assuring that workers use tools correctly; and
- changing work to reduce the grip and pressure the worker needs to apply.

When workers must carry or use high-vibration tools, other measures may be adopted to assist in the reduction of harmful effects, such as:

- the establishment of work breaks to avoid long periods of continuous exposure to vibration
- showing workers hand and finger exercises to stimulate blood flow; and
- informing and training workers on vibration hazards, signs of injury, risk reduction methods, and reporting of any symptoms.

## **FURTHER INFORMATION**

(ENGLISH)

ISO 5349: 1986. Mechanical vibration - Guidelines for the measurement and the assessment of human exposure to hand-transmitted vibration

### **3.4.3 Radiation**

Management in a health facility that uses any source of radiation is responsible for:

- a) protecting exposed workers and
- b) complying with all technical standards.

#### **3.4.3.1 Non-ionizing Radiation**

As with visible light, non-ionizing radiation can increase the temperature of a targeted object. The different types of non-ionizing radiation include radio frequency waves, microwaves, infrared light, visible light, ultraviolet radiation, lasers, magnetic fields, and ultrasound.

##### ***Ultraviolet Radiation***

Ultraviolet radiation is used in certain dermatological procedures. It also is used as a germicidal lamp in tuberculosis control. Germicidal lamps are used to disinfect foodstuffs, in the sterilization of equipment, in phototherapy lamps, and in illuminating lamps. The biological effects of exposure to ultraviolet light are due to damaging photochemical reactions in living tissue and depend on the wavelength range of the radiation. Since penetration is low, effects are limited to the anterior parts of eyes and to

unprotected skin causing temporary conjunctivitis, partial loss of vision, early aging of the skin, and cancer of the skin.

When sources are sufficiently intense to pose a risk, protection against overexposure can be achieved by combining:

- administrative control methods;
- engineering control methods; and
- personal protection.

Administrative and engineering controls should be given priority so as to minimize the need for personal protection.

### ***Lasers***

Laser radiation may damage living tissue, primarily by a thermal effect. The extent of damage depends on the frequency of the radiation, the intensity of the beam, the duration of exposure, and the type of exposed tissue. The most sensitive tissues are those of the eyes and the skin - the retina may be temporarily or permanently damaged, skin may sustain burns, and tissue proteins may be denatured.

Lasers are used in surgery, microsurgery, blood tests, ophthalmologic surgery, and dental procedures.

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**In general, the number of persons exposed in the vicinity of a working laser should be minimized, and the duration of their potential exposure should be kept as short as possible. Laser operations should be under the control of a competent person who is aware of the hazards. A functioning laser should only be accessible to authorized personnel.**

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The potential hazards from direct or reflected emission may be reduced using physical barriers (closed rooms, absorbent panels, closed instrument cases), interlocks, and beam shutters.

Health care facilities should launch special laser safety programs. Exposed workers should be educated and trained in laser precautions. At a minimum, these programs should include:

- policies and practices for the safe use of lasers;

- training of workers in the proper use of lasers;
- assurance that the points of laser impact are free of flammable or combustible substances;
- warning signs placed at the entrance of laser-use areas; and
- precautions that are put in place for the safe use of lasers, including:
  - providing eye protectors, protective eyeglasses, or goggles to patients and exposed workers and ensuring that they are properly used;
  - protecting eyes, skin, and tissue during laser use;
  - extracting fumes at the source (e.g., isolation) whenever particulate matter is produced and providing high-filtration masks (or respirators if this is unfeasible); and
  - providing baseline and periodic medical surveillance (e.g., eye and skin examinations) of exposed personnel.

### ***Microwave and Radio Frequency Radiation***

These can be dangerous because they can produce heat within body tissue. The degree of heat depends on the radiation's intensity, the duration of exposure, and the tissue's water content and its capacity to dissipate heat. A potential effect of this type of radiation is an observable decrease in sperm count.

Microwaves are generally used for cooking or heating meals or in patient rooms. They also may be found in physiotherapy or surgery areas where they are used to heat up various elements. Microwaves can cause disturbances in pacemakers. Warning signs should be posted where microwaves are present.

Radio frequency radiation is found in communication systems that transmit radio waves, walkie-talkies, and cellular telephones used at the facility. They also are found in telemetry systems and cardiac monitors, magnetic resonance procedures, and improperly covered video terminals. Warning signs should be posted wherever radio frequency radiation may cause injury.

### ***Infrared Radiation***

Exposure to infrared radiation can occur during laser and thermographic operations. They may cause skin burns and eye injuries.

## **Ultrasound**

Ultrasound is used in physical therapy, surgery, diagnostic procedures and obstetrics. Ultrasound consists of high-frequency sound waves that cannot be detected by the human ear.

Although ultrasound apparently does not pose harm to health, exposure to auditory radiation greater than 19 kHz may result in a syndrome involving nausea, migraine headache, tinnitus, pain, dizziness, and fatigue. Temporary hearing loss also could occur.

Low-frequency ultrasound radiation also could have consequences for persons who touch areas where ultrasound is being applied. Exposure to potent ultrasound sources may cause injuries to the peripheral nervous system and to vascular structures at contact points.

Workers who operate or install ultrasound equipment may need to use adequate protective equipment for a given task if there is a probability of exposure to radiation higher than 10 kHz or low frequency radiation.

## ***Cellular Phones***

Because cellular telephones use high frequencies, they may interfere with electromedical equipment. Studies have shown that cell phones generate enough electromagnetic interference to reach up to 2 m. Through this distance, interference can go through solid concrete walls, floors, and ceilings, as well as a room's interior. Obviously, there must be a clear policy on the use of cellular telephones in a health care establishment.

### **3.4.3.2 Ionizing Radiation**

Ionizing radiation has the same properties as non-ionizing radiation with an added capability of producing ions in the exposed material. This ion production may result in direct damage to cellular genetic material and/or the production of cytotoxic materials (e.g., peroxide).

The different types of ionizing radiation are:

- alpha particles;
- beta particles;
- neutrons;
- X rays; and

- gamma radiation.

Ionizing radiation is used in a variety of treatment and diagnostic procedures, such as:

- X rays
- fluoroscopy
- angiography
- computerized axial tomography (CAT or CT scan)
- nuclear medicine scans
- teletherapy
- cobalt treatment

The effects of ionizing radiation are cumulative and can, in the long run, damage tissue. Patients and workers must be monitored and protected against scattered and direct non-essential exposure.

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**There are several chemical products (radiopharmaceuticals) that contain radioactive substances such as unencapsulated radioisotopes that are injected or implanted into patients. These radioactive substances are potentially absorbable. Normal use of these products causes none or minimal risk to workers, but certain accidents, such as spills, may expose workers to high radiation levels. It is therefore necessary to comply with guidelines for the handling of these substances.**

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### ***Radiological Protection***

The basic principle of radiological protection is to avoid all unnecessary exposure to radiation. Three fundamental strategies should be adhered to:

- **Time.** The shorter the duration of exposure, the lower the dose. Very careful work planning is therefore recommended to avoid unnecessary exposure.
- **Distance.** The greater the distance from radiation source, the lower the dose. Distance provides highly effective protection against radiation exposure.

- **Protective shielding.** If physical conditions preclude reducing radiation's intensity by increasing distance, adequate absorbent material should be placed between the worker and the radiation source such as lead aprons and other leaded barriers.

Among additional recommendations of ILO, WHO, and PAHO on occupational exposure to ionizing radiation, the following principles deserve mention:

- Work conditions should not depend on whether there is a possibility of occupational exposure. Special remuneration, agreements, or preferential treatments in terms of salary, insurance coverage, work hours, vacation time, additional days off, or retirement benefits should not be granted or used as substitutes for a provision of appropriate safety measures that ensure the required conformance to corresponding standards.
- Any woman worker should notify her employer if she thinks she is pregnant so that her working conditions can be modified accordingly. Pregnancy notification cannot be used as a reason to exclude a worker from her job. Rather, the employer must adapt working conditions to ensure that the fetus receives the same protection from exposure as does the public at large.
- No worker under age 16 shall be engaged in work involving ionizing radiation.
- No worker under age 18 shall be authorized to work in a controlled area unless under supervision and only for training purposes.

### *Video Terminals and Computers*

Most video terminals today are based on cathode ray tube (CRT) technology. CRT emits various types of ionizing and non-ionizing radiation. There is no conclusive study to date that shows the health effects of occupational exposure to radiation emitted by video terminals. At the same time, there is no assurance that they are harmless. Alternative technology such as the most recent generation of terminals - liquid crystal display (LCD) - exposes workers to lower radiation levels.

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**Health risks associated with video terminals in the workplace are closely tied to how tasks are organized: volume, rhythm, degree of worker control, hours of work and rest periods, and overall working environment (see section on "Occupational Overuse Syndrome" which appears later on in this chapter).**

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## **FURTHER INFORMATION**

(ENGLISH)

Basic Safety Standards for Protection against Ionizing Radiation and for the Safety of Radiation Sources (BSS), cosponsored by FAO, IAEA, ILO, NEA (OECD), PAHO and WHO. Safety Series No.115, (1996) <http://www.iaea.org/worldatom/>

New Zealand Legislation: Radiation Protection Act 1965 (reprinted 1986) and Radiation Protection Regulations 1982.

OSHA: <http://www.epa.gov/radiation/index.html>

NIOSH: Recommended Guidelines for Controlling Noninfectious Health Hazards in Hospitals. 2002. <http://www.cdc.gov/niosh/hcwold5c.html>

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Radiation Safety Manual, Case Western Reserve University, 2003.  
<http://www.cwru.edu/finadmin/does/web/Forms/PDFdocs/RADMAN.pdf>

Training Manual for Users of Radioactive Material, Case Western Reserve University, 2001.  
<http://www.cwru.edu/finadmin/does/web/Forms/PDFdocs/RadTrain.PDF>

Physical Safety Manual, Case Western Reserve University, 2002.  
<http://www.cwru.edu/finadmin/does/web/Forms/PDFdocs/PhysSafety.pdf>

ELECTROMAGNETIC FIELDS AND PUBLIC HEALTH : EXTREMELY LOW FREQUENCY (ELF) , WHO, 1998. <http://www.who.int/inf-fs/en/fact205.html>

Control of Smoke From Laser/Electric Surgical Procedures, NIOSH.  
<http://www.cdc.gov/niosh/hc11.html>

(PORTUGUESE)

COMISSÃO NACIONAL DE ENERGIA NUCLEAR (CNEM)

Portaria 37 - proposta de texto de criação da Norma Regulamentadora N. ° 32 – Segurança e Saúde no Trabalho em Estabelecimentos de Assistência à Saúde.  
<http://www.mte.gov.br/Temas/SegSau/Conteudo/941.pdf>

(SPANISH)

International Commission on Non-ionizing Radiation Protection: Recomendaciones para Limitar la Exposición a Campos Eléctricos, Magnéticos y Electromagnéticos (hasta 300 GHz)

<http://www.icnirp.org/documents/emfgdlesp.pdf>

Efectos de los Riesgos Ocupacionales en la Salud Reproductiva de la Mujer, NIOSH.  
<http://www.cdc.gov/spanish/niosh/docs/99-104sp.html>

Notas Técnicas de Prevención (NTP) sobre diferentes factores de riesgo: adiciones ionizantes NTP 304. [http://www.mtas.es/insht/information/Ind\\_temntp.htm](http://www.mtas.es/insht/information/Ind_temntp.htm)



### 3.4.4 Electricity

Improper use of electricity may cause death or serious injury. The health care facility should ensure that all electrical equipment and fixtures pose no risk to the health and safety of workers, patients, and other users.

In general, a health care facility's manager or administrator should ensure that:

- adequate equipment has been chosen for each task, taking into account the environment, the design, and capacity;
- equipment has been properly installed by a competent person, adhering to the manufacturer's instructions. If doubt exists concerning the possible electric overload when a new machine is brought on line, an electrician should be consulted;
- operators have been properly trained in the use of the equipment and understand that defective, obsolete, redundant and home-made or home-repaired equipment is unacceptable in the workplace; and
- all electrical equipment is properly maintained by qualified persons; "Do Not Use" and "Lockout" signs may be used when necessary.

Principal subcontractors should ensure that all independent employers and workers in a project comply with electrical safety requirements.

Inspections and regular checks of all electric equipment in the unit are good preventive and maintenance practices.

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**All new equipment should be inspected before first use, preferably by an authorized electrician. This is particularly important in the case of imported equipment in order to verify that they comply with national electrical safety specifications.**

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Electrical installations in hazardous areas such as locations where ignitable dust, vapors or gases may accumulate should be especially designed. This may imply the use of fire-resistant equipment, purging systems, intrinsically safe and/or dust-eliminating equipment, and protective equipment against ignition. If the ambient air is highly corrosive, protecting the equipment or using different equipment is recommended.

### High-voltage Equipment

Some laboratory equipment such as electrophoresis baths utilize energy supplies capable of delivering high voltages and currents. This type of equipment and its power supply should incorporate:

- automatic breakers if ground leaks are detected;
- protection against overloads to safeguard the supply unit;
- security breakers to shut off power;
- grounded outlets;
- unobstructed air intakes;
- clean, unsaturated dust filters; and
- operation strictly in accordance with manufacturer's specifications.

Once this type of equipment is in use, the unit and the power supply should be labeled using signs with the warning, "DANGER – HIGH VOLTAGE".

## **FURTHER INFORMATION**

(ENGLISH)

NZCEP11: 1993 New Zealand Electrical Code of Practice for Inspection and Testing of Low Voltage Installations for Certification Purposes

NZCEP12: 1993 New Zealand Electrical Code of Practice for Electrical Installations - The Safe Use of Electricity in Medical Locations and Associated Areas

Standards of the United States of America

AS 2500: 1986 Guide to the Safe Use of Electricity in Patient Care

AS 3003: 1995 Electrical Installations - Patient Treatment Areas of Hospitals and Medical and Dental Practices

AS 3551: 1988 Acceptance Testing and in Service Testing of Electro Medical Equipment

## **3.5 CHEMICAL HAZARDS**

Several factors can affect the injuries caused by chemical hazards in the workplace. These factors include the toxicity and physical properties of the substances, work practices, the nature and duration of exposure, the effects of combined exposure, the routes of entry to the body, and the worker's susceptibility.

A chemical safety program's main objective is the systematic identification and investigation of potentially harmful risks so as to minimize the occurrence of damaging effects on health caused by chemical substances in the workplace.

The program should define ways to ensure that workers potentially exposed to chemical agents are offered education and training on the nature of the risks and ways to assess and control chemical exposures. This includes safe storing and emergency plans.

Transport, storage, and disposal of chemical wastes and therapeutic and diagnostic agents should comply with toxic waste/residue management policies.

### **Principles of Operational Control**

The principles of operational control for the use of chemical products are:

- eliminating hazardous substances wherever feasible;
- substituting a less hazardous substance or process (for example, a less flammable solvent);
- isolating the hazard by increasing the distance or erecting a barrier between the substance and the worker;
- minimizing the risk during installation by providing overall and local ventilation to remove or reduce the concentration of airborne contaminants such as fumes, gases, vapors, and mists;
- establishing engineering controls to control or minimize the generation of hazardous substances (for example, smoke extractors)
- protecting workers by providing personal protective equipment to prevent physical contact with contaminants; and
- establishing safe work practices; these usually include management decisions that require workers to work in a safe manner (for example, giving access to authorized persons only; reducing re-exposure time; systematic cleaning and decontamination, etc.).

### **Potentially Hazardous Chemical Substances**

Health care workers are potentially exposed to many chemical substances in the workplace, such as:

- anesthetic waste gases and vapors (nitrous oxide, enflurane, halothane, isoflurane);
- chemotherapeutic agents (antineoplastic, cytotoxic, antiviral, and antibacterial drugs);
- cleaning agents (disinfectants such as isopropyl alcohol, iodine, betadine, chlorine);
- sterilizing agents (such as glutaraldehyde, ethylene oxide);
- X-ray developing agents;
- insecticides and rodenticides;
- medications;
- soaps and detergents;
- solvents (such as ethanol, acetone, benzoin);
- tissue fixers and agents;
- inorganic mercury;
- latex.

The following sections summarize the most common categories of chemical hazards.

### 3.5.1 Aesthetic Gases and Wastes

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**Occupational exposure to anesthetic gases may cause spontaneous abortions, infertility, congenital malformations, and cancer. Nitrous oxide is also responsible for hematological abnormalities and neurological injuries, while enflurane (ethrane<sup>®</sup>) is also hepatotoxic, a nervous system irritant, and cardiotoxic.**

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Anesthetic gases may be released into work areas such as operating rooms, patient recovery areas, and delivery wards.

While most gas leaks occur through defective equipment seals, poor administrative techniques and exhalation by patients also can be sources. Low levels of nitrous oxide, halothane, enflurane, and isoflurane may be released by any of these means. Exposure to gases generated by anesthetic vaporizers while the anesthesia technician fills the vaporizer also may occur.

## Recommendations

Adequate ventilation, gas scavenger systems for extracting waste and exhaled gases in induction masks, and regular checks of anesthetic equipment are important components of exposure reduction programs.

### 3.5.2 Chemotherapeutic Agents

Some medications may be extremely dangerous for those handling them frequently in their work. This category of chemical substances includes most of the antineoplastic agents (used in the treatment of cancer and other tumors) such as vincristine, dacarbazine, mitomycin, cytosine, arabinoside, and fluorouracil. The handling of antibacterial, antiviral, and other classes of drugs (e.g., interferon A, chloramphenicol, etc.) also requires special precautions.

The most severe dangers are mutagenicity (cancer) and genotoxicity (malformations in children and fetal loss).

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**The greatest risk of occupational exposure to cytotoxic drugs occurs while they are being prepared and administered. Other aspects of patient care such as the management of spills and waste may generate additional occupational hazards.**

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There are no available screening tests that reliably assess exposure. Employers are responsible for ensuring that the employees who are involved in the handling of cytostatic drugs are aware of the latest techniques for monitoring their exposure and health.

### Recommendations for Health Care Facilities that Use Cytotoxic Drugs

- All workers who could be exposed should be fully informed of all potential hazards and of the need to take adequate precautions.
- Written policies and procedures must be set.
- Management should invest in educational and training programs in order to teach personnel about the hazards associated with handling these types of drugs, the different exposure routes, and the ways to protect themselves and others from unnecessary exposure.

- Adequate safety measures should be taken in preparing and administering drugs to patients, managing spills, and routinely disposing of wastes as ways to reduce unnecessary worker exposure.
- Any direct exposure should be documented for future consultations.

### 3.5.3 Sterilizing Agents

This section describes some of the most frequently used agents in health care establishments.

#### Ethylene Oxide

Ethylene oxide is used in the health industry as a sterilizing agent for accessories and medical equipment. Hospital areas that use sterilizing agents include operating rooms, supply centers, renal dialysis units, departments of respiratory therapy, and areas with autoclaves. Its use is particularly important in the sterilization of items that are sensitive to heat and humidity such as some plastics that cannot, therefore, be sterilized with vapor.

There is evidence that the inhaled gas may cause leukemia among sterilization service personnel. The liquefied gas provided in gas cylinders can cause dermatitis, blisters, and burns when spilled or splashed upon the skin. It has also been reported that ethylene oxide induces premature births and abortions after exposure during pregnancy.

#### *Recommendations*

- Apply effective control measures (for example, enclosed use or installation of local exhaust ventilation).
- Introduce safe work practices in order to reduce worker exposure.

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**Since the odor of ethylene oxide cannot be detected until concentrations reach roughly more than 700 ppm, significant exposure may occur without the worker's awareness. This characteristic underscores the importance of establishing an effective and reliable exposure control system.**

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#### Formaldehyde

Formaldehyde is a tissue sterilizer and preservative used in dialysis units, pathology departments, supply centers, and anatomy laboratories.

Gaseous formaldehyde is an eye and respiratory-tract irritant. As a liquid solution, formaldehyde can cause primary irritation and allergic dermatitis. Formaldehyde exposure has been associated with occupational asthma in hospital settings and other working environments.

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**The U.S. Environmental Protection Agency (EPA) has classified formaldehyde as a probable human carcinogen, the use of which has to be controlled in order to maintain exposure levels as low as possible.**

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### *Recommendations*

- educate personnel on chemical risks;
- conduct health surveillance of exposed workers; and
- provide adequate ventilation.

### **Glutaraldehyde**

Glutaraldehyde is used as cleansing agent, disinfectant, sterilizing agent, biological tissue fixative, and as a component in the development of X-ray films.

Skin contact with glutaraldehyde solutions, aerosols, and vapors may cause eye irritation and irritant or allergic contact dermatitis. Inhalation of vapors and aerosols may cause nose, throat, and lung irritation as well as headaches and nausea. Respiratory sensitization may cause allergic rhinitis and reactions that resemble asthma.

### *Recommendations*

- substitute a less hazardous product for glutaraldehyde or change the process; and
- if it is impossible to introduce a substitute, isolate the procedures and processes where glutaraldehyde is used, institute proper work practices, install local exhaust ventilation and use personal protective equipment (gloves, eye protectors, masks, and, when necessary, certified respiratory protective equipment).

### 3.5.4 Chemical Products for Processing X-ray Films

Because there are so many chemicals involved in developing X-ray films, it is important to fully understand the best procedures that can be used to avoid associated health risks.

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**Repeated skin exposures to certain chemical products may cause dermatitis. Gases produced may irritate the eyes and throat as well as cause respiratory difficulties. Extreme exposure may cause headache or chest pain.**

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#### *Recommendations*

Control should focus on containing chemical substances at their source. Ventilation should be provided as a second-line defense. If technically possible, safer chemical substances should be substituted.

Skin contact should always be avoided. Adequate protective work clothing should be worn during the routine cleaning of processor units and while manually mixing chemical products.

### 3.5.5 Inorganic Mercury

Acute exposure to mercury vapor can produce nausea, chills, malaise, thoracic pains, breathing difficulties, coughing, inflammation of buccal mucosa and the gums, salivation, and diarrhea. Acute inhalation of a large quantity of the substance may cause serious respiratory irritation and kidney damage. Chronic exposure may cause fatigue, anorexia, and gastrointestinal disturbances.

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**Mercury contamination in health care facilities is primarily caused by breakage of thermometers and blood-pressure monitors. Most of these spills do not pose serious hazards provided that proper cleaning measures are taken. If the spills are not properly cleaned, mercury may accumulate on a surface and then evaporate where it will then be constantly inhaled by workers.**

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#### *Recommendations*

- The first step should be to immediately isolate and clean the area.



- As with any hazardous substance in the workplace, a procedure should be established for managing spills and cleaning contaminated surfaces.
- Any person who cleans up spills should use adequate personal protective equipment including protective clothing and gloves.
- Cleaning after a major spill or a major mercury contamination (for example, mercury extracted from manometers) should be conducted exclusively by trained persons.
- The floor and working surfaces in areas where equipment that contains mercury is used should be waterproof.
- It is important to control the disposal of mercury waste in dentistry centers.

### **3.5.6 Latex Sensitivity**

The introduction of standard universal precautions in health care has brought about major improvements in infection control. Gloves are a principal means of protection. Health care workers they protect themselves against HIV and other bloodborne diseases by using protective gloves.

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**Sensitivity to latex is a serious threat to the health and work of some health professionals and patients. It can cause a variety of allergic reactions ranging from urticaria to rare anaphylactic shock. Skin injuries caused by the allergic process can be a portal for infections.**

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#### ***Recommendations***

- Disseminate information on the effects of latex sensitivity to enable workers to identify adverse reactions and adopt preventive action before the symptoms worsen.
- Encourage personnel to seek help when actual or potential allergy is present.
- Provide alternatives to latex-based equipment, if possible.
- Compile information about different options to be considered for purchase.

### **FURTHER INFORMATION**

(ENGLISH)

Cytotoxic Drugs: <http://www.cdc.gov/niosh/pdfs/88-119-p.pdf>

Chemical Safety:

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<http://www.cwru.edu/finadmin/does/web/Forms/PDFdocs/ChemMan.PDF>

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Biomedical Laboratories Code of Practice. <http://www.cabq.gov/p2/index2.html>

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<http://www.cwru.edu/finadmin/does/web/Forms/PDFdocs/Benzene.pdf>

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Massachusetts Chemical Fact Sheet: Ethylene Oxide <http://www.h2e-online.org/pubs/eo.pdf>

OSHA Safety and Health Topics: Hazardous Drugs <http://www.osha.gov/SLTC/hazardousdrugs/>

Agency for Toxic Substances and Disease Registry (ATSDR) fact sheet

<http://www.atsdr.cdc.gov/tfacts137.html>

Ethylene Oxide Sterilizers In Health Care Facilities: Engineering Controls and Work Practices

[http://www.cdc.gov/niosh/89115\\_52.html?](http://www.cdc.gov/niosh/89115_52.html?)

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<http://www.cdc.gov/niosh/latexalt.html>

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Tel (416)250-7444. <http://www.hchsa.on.ca>

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contact Jolie Patterson at [jpatterson@hcwh.org](mailto:jpatterson@hcwh.org) to receive free brochures

GEN-06 Green Birthdays

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(PORTUGUESE)

Portaria 37 - proposta de texto de criação da Norma Regulamentadora N.º 32 – Segurança e Saúde no Trabalho em Estabelecimentos de Assistência à Saúde.  
<http://www.mte.gov.br/Temas/SegSau/Conteudo/941.pdf>

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[http://www.mtas.es/insht/information/Ind\\_temntp.htm](http://www.mtas.es/insht/information/Ind_temntp.htm),

Efectos de los Riesgos Ocupacionales en la Salud Reproductiva de la Mujer, NIOSH,  
<http://www.cdc.gov/spanish/niosh/docs/99-104sp.html>

Anestésicos en Odontología: <http://www.siafa.com.ar/notas/nota69/control.htm>

Alergia al Látex:

Cómo Prevenir Reacciones Alérgicas al Látex de Caucho en el Trabajo, NIOSH, 1997  
<http://www.cdc.gov/spanish/niosh/docs/97-135sp.html>

Alergia al látex, NIOSH, 2003  
<http://www.cdc.gov/spanish/niosh/fact-sheets/fact-sheet-705006.html>

### **3.6 LABORATORY SAFETY**

Conducting hazard assessment in hospital laboratories is particularly difficult considering the wide range of occupational hazards present: fires, explosions, toxic aerosols and vapors, corrosive-substance spills on the skin and eyes, thermal burns, cryogenic burns, falls, cuts, and abrasions. Chemical substances and radiation and infectious agents are the

most difficult to assess. Compared to industrial environments, laboratory exposures are typically short lived, intermittent, and involve small quantities of compounds and mixtures. Little is known about the health effects of such exposures.

Given the difficulties in quantifying risk, an effective strategy for achieving laboratory safety is to ensure that control measures are developed or that universal precautions are applied. In this context, “universal precautions” are understood as the measures such as ventilation, substitution, personal protection, and documentation of storing, handling, and disposal procedures that can be taken to eliminate exposure regardless of the agent involved.

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**The first step in establishing a laboratory health and safety system is to develop policies and procedures. For the system to function adequately, policies and procedures must be converted into standardized work practices.**

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## **FURTHER INFORMATION**

(ENGLISH)

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<http://www.who.int/csr/resources/publications/biosafety/en/Labbiosafety.pdf>

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## **3.7 ERGONOMIC HAZARDS**

### **3.7.1 Handling Loads**

Musculoskeletal injuries and back pain are serious problems in the health industry and represent a major cause of absenteeism.

Although lumbar injuries may occur as a result of a single event, they are usually a cumulative effect of many episodes of improper postures, movements, weights, and forces that cause progressive wear and tear over time.

Handling loads deals not only with lifting, transferring, and positioning of patients, but also with other tasks such as those of staff working in ambulances, doing computer work, providing support services, and working in areas such as radiology and physiotherapy.

In community services, load handling problems may derive from difficult working conditions and limited possibilities for altering the environment so as to minimize hazards.

Training and education of workers on lifting methods cannot by themselves solve the basic problems involved in the manual handling of loads. A broader, multidisciplinary focus is necessary. Employers and employees must collaborate to reduce hazards in load-handling tasks and prevent injuries and accidents.

This requires:

- A. The identification of hazards and dangers in the manual handling of loads should be based on a preventive and curative focus:
  - Preventive methods include safety inspections, monitoring of tasks, and the application of ergonomic principles in the design of equipment and installations.
  - Curative methods include research reports, reports of discomfort, use of a hazard registry to identify existing and potential problems and an event analysis for investigating and preventing accidents and incidents.
- B. The assessment of load handling tasks that present the highest risk of accidents should take into account the following factors:
  - how tasks are performed by observing activities - for example, assessing the nature of loads, heights, postures, actions, and movements involved in the work;
  - worksite design and layout and ergonomic principles;
  - the duration and frequency of load handling;
  - location of loads and distances moved;
  - loads and forces including assessment of patient size, extent of mental cooperation, and physical coordination;
  - properties of the loads and the equipment;
  - organization of the work and the work load;
  - environmental conditions (such as lighting, heat and humidity, noise, vibration, condition of floor surfaces);
  - skills and experience (knowledge of health and safety in the handling of loads and teaching ways to perform tasks that minimize accident risk);

- physical capacity of workers;
- work clothing (design of comfortable uniforms and anti-slip footwear);
- special requirements (for example, pregnancy or disability, gradual return to work, etc.); and
- maintenance and design of equipment and furniture.

C. Control options may include:

- design and redesign. Ideally, the entire facility and its equipment should be designed according to ergonomic and safety principles. Examples include the reorganization and redesign of jobs, tasks, and loads in terms of layout and, as far as possible, the elimination or reduction of the amount of manual load handling;
- ways of reduction of load handling;
- pre-purchase assessment of load-handling risks when considering new equipment or furniture; an expert in ergonomics may need to be consulted;
- provision of information on, and training in, safe load handling and lifting as part of job induction programs as well as continuing training programs for personnel;
- provision of information and education on accident prevention and principles of back care (this could be included in a health promotion program); and
- design of protective clothing that allows workers to restructure load handling tasks in a simple and safe manner. Safety footwear should be comfortable, provide good support, and have anti-slip soles.

D. Control methods must be evaluated to verify their functioning.

- The moment hazards are identified is the ideal moment to design an evaluation of the impact of actions undertaken to minimize the detected hazards.
- The evaluation and the methods that can be used to evaluate control methods are not presented in detail in this document.

### **3.7.2 Treatment of Injuries from Load Handling**

The policy for treating load handling injuries should include a reporting system and early management of lumbar pain and the accidents that cause or trigger them. Appropriate access of workers to medical or rehabilitation services will facilitate the proper

management of recovery. The policy also should cover follow-up and monitoring of the worker once he or she has returned to work.

### **3.7.3 Occupational Overuse Syndrome (OOS)**

“Occupational overuse syndrome” is a term that incorporates a range of conditions including injuries characterized by the ensuing discomfort or persistent pain in muscles, tendons, nerves, soft tissues, and joints with evidence of clinical signs. Symptoms such as pain, discomfort, and muscular weakness may continue even after clinical signs have diminished. The common feature of all of these symptoms is that they are caused by excessive and prolonged muscular tension, forced movements, repetitive movements, and improper postures.

Occupational overuse syndrome can be divided into three broad groups: local inflammations, compression syndromes, and pain syndromes. There is a variety of problems associated with the syndrome that can be distinguished from pains and ailments that are part of normal life.

The development of occupational overuse syndrome may include other factors such as stress, difficult working conditions, and improper handling of loads.

Occupational overuse syndrome may affect persons in a wide variety of jobs in health care facilities, including:

- medical and dental professionals;
- housekeeping staff;
- kitchen and laundry staff;
- maintenance workers (for example, carpenters); and
- office and other personnel who use visual display units (VDUs).

The introduction of VDUs into the workplace has changed work tasks, organization, and environment. The health sector is no exception. While the shift to electronic workstations has increased work capacity and efficiency, it also has introduced health problems often caused by a lack of knowledge and understanding. Occupational overuse syndrome is a health problem that is often related to VDU.

Risk factors for occupational overuse syndrome should be treated as priorities since these symptoms develop over time and may cause serious disturbances to body functions. This syndrome may also lead to a tendency toward accidents that prevent a return to work for long periods. Hazard control includes:

- work organization and design: control of overload, task specification, established rest breaks;
- workplace and workstation design: layout should be based on ergonomic principles;
- equipment and task design that permits relaxed postures and movements; and
- education, training, and development of skills among personnel: the worker will be provided, from his or her induction, with knowledge of safe work practices, causes and early symptoms of occupational overuse syndrome, and ways to obtain assistance to solve the associated problems.

If a worker encounters a priority hazard that cannot be reasonably eliminated or isolated, the employer should take all practicable steps to minimize the hazard and monitor worker exposure.

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**An early reporting system should be established for the incidence of ailments, pains, and discomfort. Workers should be trained to use it and become able to tackle the problem quickly before symptoms become serious or chronic. Workers' access to medical services and appropriate assessment will benefit accurate diagnosis and appropriate rehabilitation.**

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Given the widespread nature of the symptoms and the difficulty of treatment of occupational overuse syndrome, the slogan "better prevent than cure" becomes particularly important.

## **FURTHER INFORMATION**

(ENGLISH)

New Zealand OSH Publications

Approved Code of Practice for the Safe Use of Visual Display Units

Occupational Overuse Syndrome - Guidelines for Prevention and Management

Occupational Overuse Syndrome - Checklists for the Evaluation of Work

Occupational Overuse Syndrome – Treatment and Rehabilitation: A Practitioner's Guide

The Pocket Ergonomist (Keyboard/Clerical)

The Floppy Ergonomist - floppy disk and explanatory leaflet



The Ergonomic Resource Guide for Organizations in Health and Community Care: ERGO, HCHSA of Ontario, 2001

[http://www.hchsa.on.ca/products/resrcdoc/lap\\_262.pdf](http://www.hchsa.on.ca/products/resrcdoc/lap_262.pdf)

HCHSA - A Planning Guide for the Implementation of Client Mechanical Lifts

<http://www.hchsa.on.ca/products/resrcdoc/rlife349.pdf>

Physical Safety Manual, Case Western Reserve University, 2002

<http://www.cwru.edu/finadmin/does/web/Forms/PDFdocs/PhysSafety.pdf>

Office Safety CDC, 2001

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(SPANISH)

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<http://www.ergonomia.cl/bv.html>

## 3.8 MECHANICAL HAZARDS

### 3.8.1 Preventing Slips, Trips, and Falls

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**Slips, trips, and falls are the most common causes of accidents. They also are the most easily preventable. Identification of potential of slip, trip, or fall hazards is important in the prevention or reduction of the incidence of accidents in all work areas.**

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Many falls are the results of hazards that are permanent nature. These hazards are tolerated and ignored until an incident or accident draws attention to them. Notice how a simple walk in a hospital corridor may be a veritable challenge: corridors tend to get crowded with housekeeping carts, seats, wheelchairs, extra beds, stretchers, and groups of people.

Basic safety practices accomplished through order, cleanliness, and regular maintenance will eliminate a good deal of this risk. Preventative practices to consider include:

- regular inspection of floor surfaces for needed changes such as surface leveling or damage repair;

- regular inspection, and immediate correction, of any floor that is warped or uneven;
- immediate cleanup of spills;
- staff education on potential hazard and danger recognition (for example, preventing coffee or tea spills by lowering the fill level) and documenting the control measures;
- placement of signs that warn about spills or cleaning processes;
- design of effective drainage;
- assurance that all hallways and work areas (including bathrooms and kitchens) are unobstructed by unnecessary equipment and furniture;
- assurance that all hallways and stairs are always well lit;
- assuring power outlet safety in all areas, for example, in patient rooms, for computer equipment, and in hallways;
- provision and proper use of safe stepstools and ladders to reach high storage areas; and
- provision and use of appropriate footwear in work areas.

### **3.8.2 Vehicle Safety**

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**Vehicles that are used in the normal course of work are considered part of the worksite.**

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If a facility employs workers who regularly drive on public roads from worksite to worksite, on patient visits, when transporting patients (in ambulances), or when carrying goods or equipment, management should take all possible steps to ensure the health and safety of these workers and those who may be affected by their activities.

Employers should ensure that all vehicles are regularly maintained and have a valid guarantee certifying that they are safe to be driven. Thus, all internal accessories and equipment such as those used to restrain wheelchairs, stretchers, gas canisters, etc. should be regularly checked and maintained.

Workers must have a valid driver's license and they should be given information, training, and supervision to ensure their safe driving.

Depending on the type of driving required, an employer may need to provide guidelines on safe procedures, information, and training in:

- safe loading and securing of goods;
- safe loading and securing of persons, for example, those in wheelchairs and stretchers;
- safe handling of loads;
- safe handling and transport of chemical substances, including gas canisters and bottles;
- safe handling and transport of medical supplies and samples;
- provision and safe use of fire extinguishers;
- first aid procedures;
- defensive driving and driver awareness training;
- use of safety belts and headrest adjustment;
- the consumption of tobacco, alcohol, and other drugs while driving; and
- the use of cellular phones in vehicles.

### **3.8.3 Vehicle Loading**

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**Workers who drive as part of their regular normal duties require training in how to secure loads in order to prevent them from shifting during transport and how to balance these load for smooth steering and braking.**

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Vans, station wagons, and trucks used to transport equipment and other loads should be furnished with adequate safety barriers behind the front seats to protect the driver and passengers from being struck by objects that are flung forward in collisions or after sudden braking.

When possible, vehicles should be evaluated for hazards during loading or unloading, particularly when these operations occur many times during the shift as is the case for community nurses.

Vehicles intended for passengers with special requirements (ie., disabled passengers that require crutches, wheelchairs or other types of implements in order to move) should be furnished with special equipment.

## **FURTHER INFORMATION**

(ENGLISH)

New Zealand. Governmental Publications.

Everly, M. Drive to Survive. Health and Safety at Work, November 1996

Transportation of Dangerous Goods, Land Transport Safety Authority

Transportation of Medical Supplies, Ministry of Health

Vehicle Standards (Passenger Service Vehicle Construction), LTSA

## **3.9 VIOLENCE IN THE WORKPLACE**

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**In recent years, violence in the health sector has received increased attention. This is primarily due to the growing incidence of assaults and physical threats suffered by health care workers in their daily work. WHO estimates that one-quarter of all violence in the workplace occurs in the health sector. Violence should be viewed as a significant occupational hazard. This hazard is also responsible for many cases of high occupational stress level.**

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Violence and aggression in the workplace and the fear they generate may have far-reaching effects. Any form of violence may lower morale among workers, increase financial costs, and decrease productivity at a health care facility. Furthermore, victims carry psychological scars of emotional trauma.

The various manifestations of violence in the workplace include:

- using physical force to endanger or damage persons or their property;
- engaging in intimidation, coercive behavior, or fear-mongering; and
- engaging in verbal abuse and harassment including sexual, racial, and psychological harassment at work (mobbing).

Some aspects of violence, such as physical abuse, are obvious. However, the use of language is more difficult to quantify - abuse by words or gestures may be construed as offensive and distressing by some, but it may be a way to let off steam by others.

Violence in the workplace includes any incident where a worker is abused or threatened in circumstances directly related to the execution of his or her normal tasks. This type of behavior can be shown by patients, clients, visitors, members of the general public, or by fellow workers.

The WHO Program of Workplace Violence in the Health group has pinpointed situations that increase the risk of violence at workplace:

**a) Organizations at increased risk are:**

- located in urban, highly populated, and high crime areas;
- small and isolated;
- understaffed;
- under the strain of reform and downsizing;
- operating on insufficient resources, including inappropriate equipment;
- functioning in a culture that tolerates and accepts violence;
- working under a management style based on intimidation; and
- noted for poor communication and interpersonal relationships.

In this regard, attention also should be paid to abnormally high levels of absenteeism on grounds of sickness, high levels of staff turnover, and a history of violent events.

**b) Potential perpetrators** (consideration should be given to the fact that many perpetrators have themselves been victims of violence).

In general, a potential perpetrator's background may include:

- a history of violent behavior;
- a difficult childhood;
- problems of psychotropic substance abuse, especially problems with alcohol;

- serious mental illness, whose symptoms are not being adequately identified or controlled; and
- access to firearms or objects that can be used as weapons.

The following can be considered as warning signals:

- aggressive or hostile postures and attitudes;
- repeated manifestations of discontent, irritation, or frustration;
- alterations in tone of voice, pupil dilation, muscle tension, sweating; and
- the escalation of signs and a build-up of tense situations.

**c) Potential victims** (as with potential perpetrators, care should be given to avoid the use of labeling).

Professions (although all health sector professions are potentially at risk for workplace violence, the following seem to be at high risk) to particularly note:

- nursing and ambulance staff - extremely high risk;
- doctors, support and technical staff - at high risk; and
- all other allied professionals - at risk.

**Real or perceived vulnerable populations:**

- minorities;
- persons working in training or in admissions;
- workers in precarious jobs;
- young people; and
- women.

**Experience/attitudes/appearance may include:**

- a lack of experience;
- the display of unpleasant or irritating attitudes,

- the absence of coping skills, and
- the wearing uniforms or name tags.

### 3.9.1 Psychological Abuse (Harassment, Bullying, Mobbing)

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**Psychological abuse is a type of violence in the workplace inflicted by a person or a group of persons toward a worker in a systematic manner following a given pattern. Examples include attacks to a person's personal dignity, placing obstacles to hamper work performance, manipulating information, and perpetrating acts of inequality.**

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Mobbing in the workplace generates a great deal of occupational stress. This stress can trigger a wide spectrum of illnesses and has come to be a public health issue in most developed countries.

The following practices help reduce the incidence of mobbing at workplace:<sup>19</sup>

- Reduce the factors that motivate harassment: promote ethical values, justice and transparency towards employees; by example, management should promote a people-centered organizational culture instead of leadership based upon intimidation; show appreciation for staff members who have greater capability for interpersonal relationships and communication; include explicit rules in the staff manual about unacceptable persecutory or harassment behaviors (See the section “Psychosocial Risks” further on in this chapter).
- Increase awareness of those who deal in occupational health in health care establishments (occupational health and safety committees and units, supervisors, etc.) and further train them to manage mobbing.
- Adopt tools that, on the one hand, provide procedures to combat mobbing and, on the other, have a preventive effect. These include sessions with a trained facilitator; work agreements to combat mobbing; preparation of clear policies to abate the problem; establish an investigative system and registry; management of conflicts; rapid and discreet investigation of complaints; protection of the rights of the persons involved, etc.

### 3.9.2 Abuse and Aggression in the Workplace

Abuse and aggression are more frequent in certain types of activities such as:

- working in emergency services;
- being in contact with the public;
- working with valuable objects (money, storing of drugs, valuable equipment);
- working with persons under stress (those suffering pain, psychiatric disturbances or engaging in alcohol or drug abuse, etc.); and
- doing solitary work at isolated worksites.

The potential to have incidents that involve aggression is a significant risk. As for any other workplace risk, it is the responsibility of managers or administrators to take measures in order to protect workers from incidents involving violent behavior that may result in injuries, damage or health.

It also is the duty of health workers to ensure their safety at work and to be aware that their actions or omissions might cause harm to others.

### **Managing Risks Associated with Assaults and Aggression**

Early intervention is the most effective means of dealing with violence in the workplace. The recommended approach involves eliminating opportunities for violent or threatening behaviors to occur. An occupational health and safety action plan to prevent violent acts should identify the potential for violence, evaluate violent incidents, and determine control measures during or after incidents of violence.

Workers must be involved in the preparation of the action plan.

#### ***A. Identification***

Management should provide staff with information that will increase the understanding and awareness of violence and that will also bolster the motivation to report all incidents of violent behavior. A confidential reporting system should be put in place. Management should identify situations in which violent or aggressive behaviors by patients, suppliers, or clients, among others, may occur. For example:

- incidents of dissatisfaction of patients or their relatives with delays or deficiencies in the services;
- cases where the number of assigned staff is incompatible with the level of patient dependency;



- situations in which assistance is being provided to overstressed, annoyed, stress-laden, displeased or needy persons;
- dealing with disturbed persons (such as those suffering from mental or intellectual impairments or under influence of drugs or alcohol);
- working with persons in the community who have a history of violence;
- working with institutionalized clients who could have aggressive behavior toward other inpatients or staff;
- working in sites where drugs are administered or stored;
- working in isolation; and
- having insufficient security in the building and its surroundings.

Incident and accident reports should be evaluated to identify the nature and range of any violence as well as the areas at greatest risk. By grouping incidents that share similar features, patterns may be revealed that could help design preventative measures.

The registration form should include:

- where the incident occurred (including the physical environment);
- the date and hour of the incident;
- activity being performed at the time of the incident;
- victim details;
- relationship of the victim with the perpetrator;
- an account of what happened;
- witnesses;
- consequences;
- measures taken after the incident; and
- recommendations for preventing similar incidents in the future.

Reporting and investigative procedures also should be reviewed to assess their efficacy.

## ***B. Control Measures***

### **For All Workers**

Every measure should be taken to control actual or potential incidents of violence. This means that the environment and the administrative systems may need to be redesigned in order to:

- promote a humane culture that favors a pleasant social atmosphere;
- facilitate a flow of information among staff members, work units, patients, and the public (this can be accomplished by conducting team meetings, issuing protocols and codes of conduct that explain the responsibilities and rights of the patient, friends, and family members, etc.);
- change the work system to reduce the likelihood of any violent behavior (for example, by improving the handling of cash money or drugs);
- issue clear guidelines of what to do in threatening situations;
- elaborate a list of persons with sufficient experience and training in handling violent incidents including staff available during weekends and night shifts;
- keep flexible staff levels to adjust to needs;
- reduce work pressures and waiting times;
- provide information, training and follow-up in the prevention and management of violence (this should be included in employment induction programs);
- issue clear-cut policies and procedures to be followed in cases of sexual harassment;
- provide effective security and communication systems through the use of premises surveillance, controlled access, alarm systems, adequate lighting, systematic maintenance and provision of personal locators for staff that must work in isolated areas;
- change the physical environment (isolate disturbing noise, paint walls with warm tones, eliminate foul smells); and
- monitor and evaluate the effectiveness of preventive measures, for example, arrangements should be put in place so that workers can provide feedback to evaluate the effectiveness of the changes made.

Large health care facilities may consider assembling a trained crisis intervention team to respond to emergencies and, when necessary, provide escort and transport services.

### **For Workers Who Work in Isolation**

Measures that can reduce risks for persons who work in isolation, such as those that work alone in the community, include:

- providing training to detect signs of disturbance and to resolve conflicts;
- assessing risk situations and changes in client attitude and conditions;
- providing pertinent information to staff on the risk posed by the client;
- establishing two-person work teams;
- providing an adequate communication system, such as through the use of cellular phones and periodical reporting to headquarters; and
- providing special safety procedures for night work.

### **Interventions in Response to Violence**

Measures taken in response to violent incidents should aim to minimize the repercussions of violence in the workplace and to ensure that such violence will not recur.

Measures should include:

- Implementation of an action plan that helps all workers cope with the emotional and operational aspects of the issue. This action plan should also help them to react to the situation as a collective social group.
- Implementation of the use of reporting and registration systems. Workers should be guided on how and when to notify an incident without fear of retaliation or criticism.

### ***C. Assistance to Victims of Violence***

In order to minimize the negative effects of a violent incident, an appropriate post-incident response system should be provided and organized. This sort of service to internal clients should include debriefing, counseling, and support to victims and their colleagues, especially if the latter were witnesses to the violence.

This type of program should provide, at a minimum:

- medical evaluation and treatment of injuries,
- help in completing medical and legal documents, and

- legal representation and guidance.

## **FOR FURTHER ORIENTATION**

Specialized consultants

Police

Labor unions

Employee association

## **FURTHER INFORMATION**

(ENGLISH)

<http://www.mobbing.nu/index.htm>

Workplace Violence in the Health Sector – State of Art, IST & NIOSH.  
<http://www.icn.ch/SewWorkplace/WPViolenceSAP.pdf>

New Zealand OSH Publications

A Guide for Employers and Employees on Dealing with Violence at Work

Guidelines for the Safety of Personnel from the Threat of Armed Robbery

What Employees need to know about Violence at Work

USA:

<http://www.dir.ca.gov/dosh/dosh%5Fpublications/hcworker.html>

“VIOLENCE: Occupational Hazards in Hospitals”. DHHS (NIOSH) Publication No. 2002–101.  
 April 2002. <http://www.cdc.gov/niosh/2002-101.html>

VIOLENCE: Occupational Hazards in Hospitals, NIOSH, 2002  
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Emotional Abuse in American Workplace <http://www.mobbing-usa.com/index.html>

<http://agency.osha.eu.int/publications/reports/104/en/stress.PDF>

Canada:

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[http://www.healthandsafetycentre.org/pdfs/healthcare/code\\_white.pdf](http://www.healthandsafetycentre.org/pdfs/healthcare/code_white.pdf)

“Workplace Violence Prevention Program”. Health Care Health & Safety Association of Ontario. 2001. [http://www.hchsa.on.ca/products/resrcdoc/lap\\_267.pdf](http://www.hchsa.on.ca/products/resrcdoc/lap_267.pdf)

Guidelines For Security and Safety Of Health Care And Community Service Workers, Canada – 1998 <http://www.dir.ca.gov/dosh/dosh%5Fpublications/hcworker.html>

Injury Prevention Resources for Health Care – Violence, British Columbia

<http://healthcare.healthandsafetycentre.org/s/Violence.asp>

ILO – WHO:

Framework Guidelines for Addressing Workplace Violence in the Health Sector (2002)

[http://www.who.int/violence\\_injury\\_prevention/violence/interpersonal/en/WVguidelinesEN.pdf](http://www.who.int/violence_injury_prevention/violence/interpersonal/en/WVguidelinesEN.pdf)

Raising awareness of Psychological Harassment at Work; Protecting Workers's Health series no. 4 (2003)

[www.who.int/oeh/OCHweb/OCHweb/OSHpages/OSHDdocuments/WHOOSHDdocuments/WHOCHDocumentsHQDocs.htm#PWH](http://www.who.int/oeh/OCHweb/OCHweb/OSHpages/OSHDdocuments/WHOOSHDdocuments/WHOCHDocumentsHQDocs.htm#PWH)

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(SPANISH)

“VIOLENCIA, Peligros ocupacionales en los hospitales”. DHHS (NIOSH) Núm. de Publicación 2002–101. Abril 2002 <http://www.cdc.gov/spanish/niosh/docs/2002-101sp.html>

ACOSO MORAL: <http://www.mobbing.nu/index.htm>

Consejos para defenderse en caso de acoso laboral

<http://www.mobbing.nu/primerosconsejos-achp.htm>

Mobbing, violencia psicologica en el trabajo, 2000

<http://www.prevencionintegral.com/Default.asp?http://www.prevencionintegral.com/Novedades/mobbing/conclusiones.htm>

### 3.10 PSYCHOSOCIAL HAZARDS

Violence, which is considered to be the greatest source of stress in the health sector, was presented in detail in the section “Violence in the Workplace” that appeared earlier in this chapter. This section deals with other psychosocial issues in the health sector.

These are highly important aspects, not only from the viewpoint of managing occupational health and safety, but also for the overall administration of costs, quality of services, and personnel. It is important to note that psychosocial risks among health workers are most often associated with burnout. This syndrome manifests itself in workers’ behavior along three dimensions that are highly detrimental to patients and the services in general: exhaustion, cynicism, and inefficacy.

#### 3.10.1 Stress and Fatigue

Psychosocial stress (or, in this Manual, simply “stress”) can be defined as the psychophysiological mechanisms through which psychosocial risk factors affect an organism.

All workers are exposed to some source of pressure at work. Individuals react differently and have unique capabilities for coping with stressful situations. Many do not suffer any adverse effects from the exposure. However, prolonged exposure to intense pressure may have detrimental effects on health. Stressors in a person’s life and work may lead to anxiety when that person’s coping mechanisms overload due to conditions such as repeated exposure to stressors, high stressor intensity, or an individual’s susceptibility.

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**Occupational stress is a complex process that links and combines several aspects of workers’ everyday life such as working hours, job organization, physical environment, personal health, and private life pressures.**

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Factors that may contribute to stress in the health sector include:

- the intensity and duration of physical and mental loads - a state of “chronic emergency,” difficult work shifts, inflexible working hours, unpredictable working hours, prolonged working hours, or shifts without social interaction;
- emotional stress in caring for the ill;
- the worker’s personal or health problems (healthy and fit persons often cope better with physical and mental stress);

- organizational factors such as the lack of control over workload, poor work planning, inadequately trained personnel for client dependency, poor communication in the workplace, organizational changes that lead to job insecurity, etc ; and
- the immediate working environment - lighting, noise, work space, workstation design, etc.

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**Stress in workers may manifest in high absenteeism rates, high turnover, low productivity, high accident and illness rates, and poor concentration that leads to greater error rates and mood problems. Alcohol and drug dependency and depression also are more frequent among employees under stress.**

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Occupational stress theories once focused on the individual more than on the work. Today, however, it has become clear that a stress management program offered to workers will not control the causes of stress. Although such programs may be able to help, they will not remove the risk because they act upon the victim and not on the stress factor. Such programs may assist the victim but do not address the source of the stress with the aim of alleviating the hazard.

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**Consequently, today it is understood that an adequate management of occupational stress implies organizational changes including improved communication in the workplace and support for changes in staff such as physical training, relaxation, and adequate time management.**

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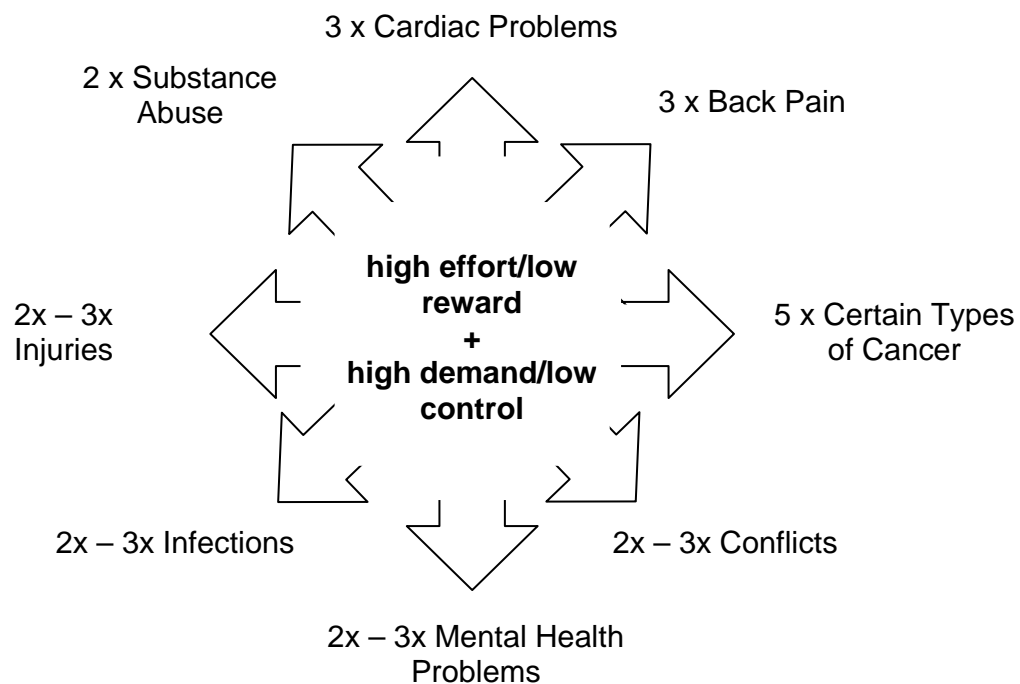
From a legal point of view, aspects related to personnel stress and fatigue may be handled in the same manner as other hazards or risks in the workplace. Managers or administrators should be accountable for taking feasible measures to prevent health problems caused by the way work has been organized at the health care facility. Under certain circumstances, the effects of stress and fatigue represent an important danger that may lead to serious legal consequences since persons under stress are more prone to commit errors and cause accidents.

### **3.10.2 Effort, Reward, Demands, and Control**

There have been models constructed to explain how organizational factors can cause health problems among workers. The best known are Karasek and Theorell's model and the Siegrist model which study problems of two organizational anomalies, "high effort/low reward" and "high demand/low control," respectively.

The high effort/low reward model applies to organizations in which the worker considers the work rewards as insufficient in terms of both remuneration and incentives such as recognition of effort. High demand/low control organizations require high performance but give the worker no freedom to organize his or her own way to accomplish a task. Often, these two characteristics coexist in the same organization.

The following figure summarizes the results of studies conducted on the two models. These studies illustrate the strong influence of psychosocial factors on workers' health problems.



Example: Workers under prolonged conditions of high effort/low reward and high demand/low control have a 2 to 3 times higher probability of contracting infections in comparison to workers that do not suffer these conditions.

Adapted from the Minister of Public Works and Government Services Canada (20)

Recent studies have delved deeper into these matters, demonstrating the important synergistic effects of these organizational hazards when workers consider them as unjust and as signs of disrespect. According to these studies, two types of justice are involved: distributive (who receives what and when) and process-oriented (what processes are involved in decision-making).



### 3.10.3 Shift Work

Health care facilities provide continuous care to highly dependent patients in emergency circumstances. Such services require the constant mental alertness and concentration of health care employees and emergency staff.

Regardless of the pattern pursued, shift work is a significant stress factor to most workers and their families.

Most shift workers face serious difficulties in biological and social adjustments. Shifts cause disturbances in circadian rhythms, poor sleep patterns, and social isolation. Night work is particularly exhausting since the employee works during physiological rest hours and sleeps during daytime thereby making his or her sleep less restorative than that of those who sleep during the night.

#### **Fatigue is a particular occupational hazard for those who work in shifts.**

Services that continually ask employees to work overtime, to be on call for longer than 24-hour periods, or to work irregular shifts without adequate rest use work practices that represent a health and safety risk and as such need to be regulated.

### **FURTHER INFORMATION**

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[http://www.chsrf.ca/docs/finalrpts/pscomcare\\_e.pdf](http://www.chsrf.ca/docs/finalrpts/pscomcare_e.pdf)

Best Advice on Stress Risk Management in the Workplace. Minister of Public Works and Government Services Canada. 2000.

Stress and Fatigue: Their Impact on Health and Safety in the Workplace. OSH. New Zealand.

Klein M. The Shiftworker's Handbook -A personal health and lifestyle guide for shiftwork professionals. Synchro Tech, New York, 1993. Available from 315 S 9th Street, Suite 211 Lincoln NE 68508 USA .

Grandjean. Fitting the Task to the Man. 4th ed. Taylor and Francis, London, 1988.

Stressat work. NIOSH. <http://www.cdc.gov/niosh/stresswk.html>

Self-Care for Caregivers: Responding to the Stress of Terrorism and Armed Conflicts, Health Canada, 2002 [http://www.hc-sc.gc.ca/pphb-dgspsp/publicat/oes-bsu-02/pdf/self-care-caregivers\\_e.pdf](http://www.hc-sc.gc.ca/pphb-dgspsp/publicat/oes-bsu-02/pdf/self-care-caregivers_e.pdf)

WHO - Work Organization & Stress, Protecting Workers' Health series, no. 3 (2003);

[www.who.int/oeh/OCHweb/OCHweb/OSHpages/OSHDocuments/WHOOSHDocuments/WHO OCHDocumentsHQDocs.htm#PW](http://www.who.int/oeh/OCHweb/OCHweb/OSHpages/OSHDocuments/WHOOSHDocuments/WHO OCHDocumentsHQDocs.htm#PW)

Health and Safety Guidelines for Shiftwork and Extended Working Hours (2000) ACTU OHS UNIT. Australia. <http://www2.actu.asn.au/campaigns/ohs/Shift10.pdf>

(PORTUGUESE)

Desgaste Físico e Mental do Cotidiano Médico. SIMESP. São Paulo. Brasil. 2002.

O Estresse no Mundo do Trabalho: Trajetória Conceitual, Análise do OSI e Proposta de uma política para as Organizações. Sampaio JR et al. FEA. Universidade de São Paulo. 2001.

(SPANISH)

El estrés en el trabajo, NIOSH. <http://www.cdc.gov/spanish/niosh/docs/99-101sp.html>

Notas Técnicas de Prevención (NTP) sobre diferentes factores de riesgo: carga mental en hospitales NTP 275. [http://www.mtas.es/insht/information/Ind\\_temntp.htm](http://www.mtas.es/insht/information/Ind_temntp.htm)

### **3.10.4 Substance Abuse**

Depending on the case, use of drugs and alcohol can be considered as a factor that contributes to stress or as a mistaken means to cope with stress.

Substance abuse may be associated with a significant rise in the incidence of injuries as well as with a drop in productivity and an increase in illnesses and absenteeism. Not only will the risk of accidents increase in the one abusing substances, but the abuse also may put coworkers at risk. The employer is confronted with late arrival at work and absenteeism, loss of time from accidents and inefficiency, and damage to installations, equipment, and other property.

The use of prescribed medications should not be overlooked when considering substance or alcohol use in the workplace. However, management of these medications may require different strategies. Strategies for substance abuse in the workplace should be integrated into the overall occupational health and safety strategy and should include identification and management of the hazards and risks.

Drug and alcohol consumption in the workplace can be dealt with by developing a clear policy for consumption, rehabilitation, and counseling. Prevention also should play a role in management's drug and alcohol policy, particularly through the Employee Assistance Program.

When a supervisor believes that work performance is deteriorating because of substance abuse, he or she can take measures to protect the health and security of the person who may be suffering from the effects of substance abuse as well as the rest of the workers. If it is concluded that the deficient performance of the worker increases the risk to

him/herself or to his/her coworkers, the employer has no other option but to remove the risk.

### **3.10.5 Recommendations**

- a) It is recommended that the situation be monitored, stress hazards be systematically identified, significant damages evaluated, and effective control methods determined. Working situations vary among and within health care facilities which implies a diverse nature in the stress factors.
- b) A confidential notification system of signs and symptoms of stress and fatigue, administered by the health care facility's Occupational Health and Safety Unit, may function as:
  - a database of factors in the organization that generate unnecessary stress among the staff that will be used in the design and evaluation of interventions; and
  - a portal for medical attention targeted at stress treatment of workers through the Employee Assistant Program (the Occupational Health and Safety Unit and the Employee Assistance Program were described in Module 2).
- c) Because an accumulation of factors are involved in generating stress, it is difficult to determine whether an employee's work is actually affected by personal problems. Consequently, it is important to implement a system that offers employees the opportunity to receive (through the Employee Assistance Program) professional help for any personal problem.

### **FOR FURTHER GUIDANCE**

Health Centers

Doctors

Ministers of Health

Labor unions

Employee associations

## **MODULE FOUR:**

### **General Conditions and Safety of the Establishments**

#### **4.1 WARDROBE ACCOMMODATIONS**

If staff must wear special work clothing, separate changing rooms for women and men must be provided complete with wardrobes or lockers where employees can store personal items and other possessions not needed during working hours. These premises should be well lit and ventilated.

Some health care facilities may need to provide separate accommodations to avoid contaminating personal clothing with work clothing such as soiled protective overalls. Double lockers are usually the solution.

When the work is being done outdoors or in damp or humid conditions, necessary measures should be taken in order to dry the clothing.

Changing rooms, spaces for hanging coats, and locker placement should comply with certain standards in accordance with the permanence of the job. Details are provided below.

All wardrobes should be clean and well maintained. These rooms should not be used to store the facility's materials or goods or anything that does not belong to the worker.

In less complex facilities where employees do not need to change their clothing, a secure space may be designated to be used for storing personal belongings.

#### **FURTHER INFORMATION**

(ENGLISH)

Standards of New Zealand:

NZS 1187: 1969 Standard Specifications for Clothes Lockers (amended 1976)

New Zealand OSH Publications:

Planning the Workplace

Other Publications:

Safeguard Buyers' Guide to Workplace Safety and Health Products and Services

(PORTUGUESE)

Portaria 37 - proposta de texto de criação da Norma Regulamentadora N.º 32 – Segurança e Saúde no Trabalho em Estabelecimentos de Assistência à Saúde.

<http://www.mte.gov.br/Temas/SegSau/Conteudo/941.pdf>

## 4.2 AIR CONDITIONING SYSTEMS

In all workplaces where air conditioning systems or similar units or devices are used to control or maintain temperature or overall atmospheric conditions, management should ensure that these systems are regularly inspected, tested, and maintained to prevent them from contaminating ambient air or drinking water.

“Sick building syndrome” is a generic term that encompasses several symptoms such as irritation of eyes, nose, and throat; skin rashes; mental fatigue; headaches; and respiratory infection in persons working indoors in inadequately designed or managed environments.

Diseases such as Legionnaire’s Disease (a severe type of pneumonia caused by the bacteria *Legionella pneumophila*) may be triggered by deficient or poorly designed and maintained ventilation systems. Diseases such as this are one of the reasons for requiring air conditioning systems to comply with performance standards for overall ventilation and workplace atmospheric conditions.

Also see the sections “Atmospheric Conditions in the Workplace” and “Overall Ventilation in the Workplace” in this chapter.

### FURTHER INFORMATION

Standards:

AS 1668: The Use of Mechanical Ventilation and Air Conditioning in Buildings

Part 2: 1991 Mechanical Ventilation for Acceptable Indoor Air Quality

NZS 4302: Code of Practice for the Control of Hygiene in Air and Water Systems in Buildings

NZS 4303: 1990 Ventilation for Acceptable Indoor Air Quality

New Zealand OSH Publications:

Guidelines for the Management of Work in Extremes of Temperature

## Planning the Workplace

Workplace Exposure Standards 1994

Other Publications:

Industrial Ventilation Manual, American Conference of Government Industrial Hygienists

Safeguard Buyers' Guide to Workplace Safety and Health Products and Services

Clearing the Air - A Health and Safety Guide to Clean Air in Offices. New Zealand Council of Trade Unions.

Godish, T. Indoor air pollution in offices and other non-residential buildings. *Journal of Environmental Health*, vol. 48(4)190-195.

NIOSH: Recommended Guidelines for Controlling Noninfectious Health Hazards in Hospitals, 2002.

<http://www.cdc.gov/niosh/hcwold5c.html>

American Institute of Architects (1996-1997) "Guidelines for Design and Construction of Hospital and Health Care Facilities".

<http://www.tsi.com/hvac/tech/hosguide.htm>

### **4.3 ATMOSPHERIC CONDITIONS IN THE WORKPLACE**

Comfortable atmospheric conditions in the workplace are essential for the health and well-being of workers. Taking into consideration the activities and processes that occur within the health care facility, an effective control of atmospheric conditions should be implemented in all workplaces to keep these conditions within reasonably comfortable parameters.

Several environmental factors determine the atmospheric conditions in each workplace. These should be taken into consideration when deciding on which control measures to implement. Factors include the temperature, humidity, air velocity, degree of radiant heat, and the amount of available fresh air in the worksite. The workers' amount of physical activity also needs to be considered.

When worksites heat up, it is extremely important to not introduce fumes that can contaminate or cause damage. It is essential to ensure that the heating systems do not represent an ignition source for any process or activity conducted nearby.

To the extent possible, factors should be controlled at the source. If this cannot be done, other options to control microenvironments should be adopted such as creating enclosures or distributing protective clothing. In addition, work practices should be

organized to minimize worker exposure to extreme heat, cold, humidity, or other adverse atmospheric conditions.

## **FURTHER INFORMATION**

Standards:

AS 1668: The Use of Mechanical Ventilation and Air Conditioning in Buildings

Part 2: 1991 Mechanical Ventilation for Acceptable Indoor Air Quality

NZS 4302: 1987 Code of Practice for the Control of Hygiene in Air and Water Systems in Buildings

NZS 4303: 1990 Ventilation for Acceptable Indoor Air Quality

New Zealand OSH Publications:

Guidelines for the Management of Work in Extremes of Temperature

Planning the Workplace

Workplace Air Quality and Environmental Conditions

Workplace Exposure Standards 1994

Other Publications:

Industrial Ventilation Manual, American Conference of Government Industrial Hygienists

Safeguard Buyers' Guide to Workplace Safety and Health Products and Services

Clearing the Air - A Health and Safety Guide to Clean Air in Offices. New Zealand Council of Trade Unions

NIOSH: Recommended Guidelines for Controlling Noninfectious Health Hazards in Hospitals, 2002.

<http://www.cdc.gov/niosh/hcwold5c.html>

## **4.4 COMMON AND RECREATIONAL FACILITIES**

A single building may contain several workplaces. Thus, the outpatient clinic area may also contain clinical laboratories, diagnostic imaging centers, appointment services, and other areas. Facilities that provide various health services may therefore have shared

amenities and sanitary installations (for example, lavatories and hand washing or drinking water installations) that are designed to meet the needs of all persons in the facility.

These installations should be conveniently located at reasonable distances from the work area. The convenient and free access to these installations should be ensured at all times as should the availability, maintenance and cleaning of these installations.

In general, shared installations should not be located in private residential houses as this would restrict access to them.

## **FURTHER INFORMATION**

New Zealand OSH Publications:

Planning the Workplace

## **4.5 DRINKING WATER**

A sufficient supply of free and cool drinking water must be provided. Water should be accessible to all workers. The establishment should make the necessary provisions to facilitate access to disabled workers.

With the exception of the water being available in fountains or reservoirs where workers can drink conveniently, adequate cups or vessels should be available at all supply points, as well as installations for cleaning them.

**Drinking water outlets should not be located inside washrooms.**

Any appliance for cooling drinking water should be regularly checked, examined, and maintained to prevent contamination of the water.

When unsafe water is provided for industrial processes or fire protection, all precautions should be taken to prevent this water from being used for human consumption.

Every precaution should be taken to ensure that drinking water supplies are not contaminated by any process or activity at the workplace.

## **FURTHER INFORMATION**

Water Supplies Protection Regulation

Standards:

Ministry of Health: Drinking Water Standards for New Zealand, 1995



AS 3500: National Plumbing and Drainage Code

AS 3500.1: 1992 Water Supply

AS 3500.4: 1994 Hot Water Supply Systems

Other Publications:

Safeguard Buyers' Guide to Workplace Safety and Health Products and Services

## **4.6 SEATING**

Seating should be provided when workers can conveniently and practically perform their tasks while sitting. Seats also should be provided for workers whose must work standing up so that they can rest.

Ergonomic principles should be followed in selecting seats. Factors such as height, weight, adjustability, structure, and stability should be considered in relation to the task or situation that these seats will be used in.

### **FURTHER INFORMATION**

Standards:

BS 3044: 1990 Guide to Ergonomic Principles in the Design and Selection of Office Furniture

New Zealand OSH Publications:

Approved Code of Practice for the Safe Use of Visual Display Units

Ergonomic Evaluation of Office Chairs

Planning the Workplace

Other Publications:

Safeguard Buyers' Guide to Safety and Health Products and Services

Seating for Office Workers (Department of Health 1989)

Video: Sitting on the Job

## **4.7 REST FACILITIES**

When seven or more persons work in the same space, such as in a particular hospital service, a suitable rest area should be provided for any worker needing to rest. Furniture such as a couch or bed is needed in the rest area.

The rest area should be secluded, well ventilated, and free from distractions such as noise, movement, or process-originated smells or fumes. A first aid room may be the most appropriate site.

If such an area is not readily available, alternative arrangements such as sending or taking the worker home may be appropriate.

## **FURTHER INFORMATION**

New Zealand OSH Publications:

Planning the Workplace

## **4.8 FIRST AID**

Management should provide and maintain health care services, first aid services (including rooms) and the associated devices. A first aid kit or cabinet should be located near washing installations with access to hot and cold water, soap, and clean towels. The first aid kit or cabinet should be kept stocked with first aid equipment and supplies appropriate for the kind of work performed and the number of workers employed.

The kit or cabinet should be clearly identifiable, kept clean and in good order, and regularly replenished. First aid supplies should be available at all times. If more than five persons are employed, someone should be appointed to be in charge of the first aid installations.

Formal first aid training should be encouraged. If more than 50 persons are employed, a registered nurse is required on the premises.

Provisions should be in place so that first aid can be offered to anyone who becomes injured or ill at work.

Emergency procedures should be clearly defined and regularly practiced.

Those responsible for providing first-aid should be aware of potential hazards such as acquiring hepatitis and human immunodeficiency virus (HIV). These persons should be aware of the precautions necessary to protect themselves when delivering first aid as well as how to practice the safe cleanup of bodily fluids and soiled surfaces.

If risks in the workplace require installations such as showers, hose attachments, or emergency eyewash fountains, these should be accessible at all times and placed near the potential hazard.

## **FURTHER INFORMATION**

New Zealand OSH Publications:

Guidance Notes on Providing First Aid Training

Planning the Workplace

Practical Guidelines for the Safe Use of Organic Solvents

Safety at Work - What Every Employee Should Know

The Safe Occupational Use of Glutaraldehyde in the Health Industries

Other Publications:

Safeguard Buyers' Guide to Workplace Safety and Health Products and Services

Order of St John Ambulance Association

The New Zealand Red Cross Society (Inc.)

## **4.9 LIGHTING**

Lighting should ensure a uniform distribution of light over the work area to reduce visual fatigue and contribute to the health and safety of everyone in the workplace.

To determine whether sufficient lighting is provided, an international standard should be used in countries where regulations do not exist. Measurements and light value readings should be conducted during both day and night in order to determine whether the lighting provided is sufficient and suitable.

Lighting should cover the entire workplace including rooms, hallways, stairs, ramps, ladders and gangways. These areas all should be lit automatically when persons pass or use them. Passing persons need not be employees necessarily and may include other persons on the premises.

In areas of precision work or in areas where special processes or machinery are used such as in surgery or dentistry installations, stronger lighting will be required. Localized lighting may also be needed.

All exits, not just regular exits, should be lit or be capable of being lit. Where and when necessary, adequate emergency lighting should be provided.

Open-air areas should be sufficiently lit for work, access, security, and safety during dark hours. An external boundary area used only occasionally for work does not need continuous lighting. However, this area should be capable of being lit when work is in progress.

The phrase “capable of being lit” implies that electric switches are located so that light is conveniently and immediately available. These switches should be readily and easily identifiable.

In deciding what lighting is suitable, consideration should be given not only to the amount of light itself, but also to surrounding brightness, wall color, and distribution of light and glare. Light colored walls add brightness, darker colors reduce reflection.

Artificial light should be shaded in order to control glare and should be directed where needed. Where and when necessary, material should be applied to cover windows and overhead lights should be installed. Blinds, shades or curtains should be used to reduce heat or glare. Any special conditions and other applicable regulations and codes should be considered. The most common are special fittings and wiring standards applied to hazardous locations such as spray booths, garage pits, dangerous goods workshops, and wet work areas.

Under certain lighting conditions (flickering fluorescent tubes), revolving wheels and high-speed reciprocating parts may appear to be turning backwards, turning slower than is the case, or be stationary. This optical illusion is called the stroboscopic effect. The hazards that this optical illusion presents to maintenance personnel, machine operators, and bypassers are obvious. The stroboscopic effect is most troublesome and noticeable when using fluorescent tubes. However, this effect can also be observed when using filament lamps.

## **FURTHER INFORMATION**

Standards:

AS 2383.1: 1991 Electrical Equipment for Explosive Atmospheres (amended 1992, 1993)

NZS 380: 1968 Specifications for Flameproof Electric Lighting Fittings

NZS 6703: 1984 Code of Practice for Interior Lighting Design

Tables in NZS 6703: 1984 (ie. pages 36-54) give details of measurements, the type of preferred lighting in various circumstances, and minimum lighting values.

NZS 6742: 1971 Code of Practice for Emergency Lighting in Buildings

Building Act 1991 (approved Building Code document G7 Natural light and G8 Artificial light)

New Zealand OSH Publications:

Approved Code of Practice for the Safe Use of Visual Display Units

Dust Explosions in Factories

Planning the Workplace

Other Publications:

Cuttle, C. Lighting for Good Visual Conditions in Workplaces. ACC, 1980.

Safeguard Buyers' Guide to Workplace Health and Safety Products and Services

Graham, G. (ed.) You and Your Sight. ACC, 1979.

## **4.10 INSTALLATION MAINTENANCE**

All managers and administrators of a health care facility should take every possible step to ensure that installations are kept clean and hygienic, that they are suitably adapted for use, and that they perform to the functional standards intended for their purpose.

### **FURTHER INFORMATION**

New Zealand OSH Health and Safety Inspectors

Suppliers' and Manufacturers' Instructions

## **4.11 MEALS IN THE WORKPLACE**

In health care establishments, a dining room, canteen or some other such installation is usually required for personnel so that they can eat their meals at work. Such canteen or other installation is not required when workers can conveniently eat their meals at home.

Any canteen or other installation provided for meals should be located in a separate area designated for that purpose and furnished with tables, seats, and an adequate means for heating water.

Canteens should be well ventilated and equipped with a washbasin and running hot and cold water for washing hands. A refrigerator is desirable.

All installations provided should be properly maintained and cleaned. These installations should not be used to store materials or goods.

A means of heating food should be provided especially in situations where extended working hours are the norm and particularly when work is done in shifts. A closet for dishes, utensils, and food that protects them from dust and pests is required. A garbage can with lid is also a must.

The employer should ensure that no food is consumed in spaces contaminated with harmful materials, processes, or other contaminants.

It is necessary to isolate any space that contains sanitary installations such as lavatories, showers, or cleaning areas.

## **FURTHER INFORMATION**

Food Hygiene Regulations

Noxious Substances Regulations

New Zealand OSH Publications:

Planning the Workplace

## **4.12 GENERAL VENTILATION IN THE WORKPLACE**

All work areas, including those areas partially open to the outdoors where ventilation can be controlled, should be ventilated by natural or mechanical means that provide a constant and sufficient supply of fresh air for the workers.

Supplying fresh air and removing hazardous or uncomfortable contaminants from the air are the two goals of the overall ventilation system in the workplace. Being able to effectively control ventilation is extremely important in managing atmospheric conditions in the workplace.

As a rule, the need for supplying fresh air is less than that for removing contaminants. This implies that certain work areas, such as those frequented by persons with respiratory infections (tuberculosis carriers, etc) or where hazardous chemicals are handled (operating rooms, for example), must be fitted with special ventilation systems. Care should be given to fresh air consumption by combustive heating systems such as those run by gas.

Wherever possible, windows should be opened to allow cross-ventilation. As a guideline, when the area relies on natural ventilation, windows should represent 10% of the floor

area and half of these windows should be able to be opened. Doors are not, in and of themselves, an appropriate means of ventilation.

## **FURTHER INFORMATION**

Standards:

AS 1668: The Use of Mechanical Ventilation and Air Conditioning in Buildings

Part 2: 1991. Mechanical Ventilation for Acceptable Indoor Air Quality

NZS 4302: 1987 Code of Practice for the Control of Hygiene in Air and Water Systems in Buildings (amended 1991)

NZS 4303: 1990 Ventilation for Acceptable Indoor Air Quality

NZS 5261: 1990 Code of Practice for the Installation of Gas Burning Appliances and Equipment (Amend 1, 1993)

New Zealand OSH Publications:

Guidelines for the Management of Work in Extremes of Temperature

Planning the Workplace

Workplace Air Quality and Environmental Conditions

Workplace Exposure Standards 1994

Other Publications:

Industrial Ventilation Manual, American Conference of Government Industrial Hygienists

Clearing the Air - A Health and Safety Guide to Clean Air in Offices. New Zealand Council of Trade Unions

Safeguard Buyers' Guide to Workplace Safety and Health Products and Services

## **4.13 REMOVAL OF VAPORS, FUMES, DUST, AND OTHER CONTAMINANTS**

Health workers should be protected from inhaling any type of contaminant in the workplace. Dust, fumes, vapors, and other impurities generated by any work process must be controlled or removed at the source.

Control measures may include dilution, ventilation, filtering, mechanical extraction systems, or a combination of these.

Mechanical extraction appliances should prevent contamination from any other working room or space.

When designing extraction systems, contaminants must flow far from the area where workers breathe, rather than flowing through it.

While deciding which control method is the appropriate one to implement, it is important to consider the relative toxicity of the contaminant as well as other characteristics such as flammability and corrosive properties.

If eliminating contaminants or isolating workers from contamination is impractical, hazards should be minimized. Minimization requires the following:

- monitoring workers' exposure;
- providing adequate protective clothing and equipment and ensuring that they are used;
- monitoring workers' health (with previous informed consent by workers) in relation to the hazard; and
- undertaking any other practical means to minimize the effects of hazards to workers.

Aspects related to specific contaminants, including the parameters for ventilation as a means of control, are found in several legislations. These legislations include regulations on processes that involve asbestos, abrasive puliment, spray paint, electrosilver and lead.

## **FURTHER INFORMATION**

Asbestos Regulations

Noxious Substances Regulations

Standards:

AS 1668: The Use of Mechanical Ventilation and Air Conditioning in Buildings

Part 2: 1991 Mechanical Ventilation for Acceptable Indoor Air Quality

NZS 4302: Code of Practice for the Control of Hygiene in Air and Water Systems in Buildings

NZS 4303: 1990 Ventilation for Acceptable Indoor Air Quality



NZS 6101: Classification of Hazardous Areas

Part 1: 1988 Flammable Gas and Vapor Atmospheres

Part 2: 1990 Combustible Dusts

Part 3: 1991 Specific Occupancies (Flammable Gas and Vapor Atmospheres)

NZS 7203: 1992 Safety in Laboratories - Fume Cupboards (Amendment 1, 1992)

Atmospheric Conditions in the Workplace

Glutaraldehyde in Health Industries

Guidelines for the Safe Use of Organic Solvents

Safety at Work - What Every Employee Should Know

Welding Safety

Workplace Air Quality and Environmental Conditions

Workplace Exposure Standards 1994

Other Publications:

Industrial Ventilation Manual, American Conference of Government Industrial Hygienists

NZIECP The Safety of Electricity in a Hazardous Area

Safeguard Buyers' Guide to Safety and Health Products and Services

#### **4.14 WASHROOMS AND BATHROOMS**

Separate adequate and sufficient lavatory installations should be available for women and men who work or are at the health care facility.

When the establishment houses different types of services in the same facility, management should provide sufficient lavatory installations on the same scale as if the facility had one single employer. Minimum recommendations are:

- One water closet for up to 15 women workers, 2 for a maximum of 20, and 1 for each additional 20 women workers thereafter;
- One water closet for up to 20 men workers, 2 for a maximum of 30, and 1 for each additional 30 workers thereafter;

- One urinal for 15 male workers, 2 for a maximum of 30, and 1 for each additional 30 workers thereon.

Toilets should be constructed and located so as to ensure privacy. Access should not be through changing rooms for the opposite sex. Installations should be easily accessible, well lit and ventilated as well as sheltered from the weather. If they are sited outside of the building, there should be well lit and, if possible, covered access to these installations.

Water closets should not open directly to workrooms, dining areas, or any other rooms where food is prepared. Installations for washing and drying hands with hot and cold water are required as are soap and clean towels or other means of effectively drying the hands.

Appropriate materials for construction may include waterproof materials and floors that can be easily cleaned to maintain hygiene. Toilet paper and a means to hang clothes should be provided. Adequate disposal of hygienic pads are necessary for women.

Unisex installations may be used if users are family members and when the number of workers is usually less than 15. Such installations should be completely enclosed to ensure privacy, capable of being securely and efficiently locked, and furnished with disposal installations for hygienic pads. Urinals are not necessary.

Lavatories also should be provided for the disabled. These installations can be used by persons with or without disabilities and should provide a sufficient quantity of conveniences for all users. When installations are to be used exclusively by the disabled, there needs to be 1 installation for every 9 users.

As a rule, when management tries to determine whether installations for workers are sufficient, installations for the general public need not be considered.

## **FURTHER INFORMATION**

Standards:

NZS 2038: 1966 Stainless Steel Urinals and Flushing Apparatus

New Zealand OSH Publications:

Planning the Workplace

NZS 3331: 1972 Specification for Quality of Vitreous China Sanitary Appliances

NZS 4121: 1985 Code of Practice for Design for Access and Use of Buildings and Facilities by Disabled Persons

NZS 4616: 1990 Washbasins

#### **4.15 HANDWASHING INSTALLATIONS**

Patient-care areas should have adequate hand washing installations or at least have access to a nearby sink. Installations should provide everything necessary to wash hands: cold water (and hot water when the establishment is in a cold climate zone), soap, and clean towels or other means of effective drying.

#### **4.16 CONTAINERS FOR THE SAFE DISPOSAL OF USED NEEDLES AND SYRINGES**

Any establishment that provides medical care to patients must have sturdy waste containers for disposing of used needles and syringes. To prevent accidents, containers should be closed before they are completely filled.

#### **4.17 WASHING INSTALLATIONS**

Management should install adequate, comfortable, and accessible washing installations for all workers with provisions for the disabled. Installations should be separate from other spaces used for any other process or activity.

All installations, devices, and areas provided for washing should be properly maintained and cleaned. These areas should not be used for the storing of materials or goods.

The installations should provide cold and hot water, non-irritating and convenient soap or other cleansing agent, nailbrushes, and suitable amenities for drying hands and face. Hot water should be regulated and kept at a temperature that prevents thermal injuries or burns.

Necessary precautions should be taken to ensure that hand drying installations do not spread disease. To prevent this, disposable paper towels, cloth-towel rolls, or electrical hot air dryers may be used. Workers should not share towels.

If workers need to shower during the workday, showers should be installed with running cold and hot water, soap, and cloth towels that are laundered and changed at reasonable intervals necessary to maintain a clean supply.

Showers also are needed for workers who become exposed to toxic, infectious, or irritating substances as well as for those working in very hot environments such as with boilers. Transport of these contaminants to private homes should be avoided.

One shower should be provided for every 7 workers ending their shift at any given time. Showers should have suitable doors or curtains so that privacy is ensured. Room for

drying and changing is needed as are slip resistant floors. Doors leading to the showers should have clear signs indicating the gender the installations are intended for.

## **FURTHER INFORMATION**

New Zealand Standards:

AS 3588: 1989 Shower Bases and Shower Modules

NZS 2038: 1966 Stainless Steel Urinals and Flushing Apparatus

NZS 3331: 1972 Specification for Quality of Vitreous China Sanitary Appliances

NZS 4121: 1985 Code of Practice for Design for Access and Use of Buildings and Facilities by Disabled Persons

NZS 4616: 1990 Washbasins

New Zealand OSH Publications:

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## **4.18 FLOOR DRAINAGE**

Wherever floors may get sufficiently wet to warrant draining of the water, effective drainage should be provided.

If in-floor drainage lines or drainage pipes are used, they should be covered in such a way that they can be accessed easily. Floors can be graded to facilitate drainage.

## **4.19 FIRE PRECAUTIONS**

Management must ensure that the facility and all its work areas comply with fire safety requirements. Requirements include the number, type, and location of fire extinguishing devices, alarms, and evacuation systems and installations.

All effective fire control procedures and methods must be used to minimize the risk and consequence of fires and to ensure the safety of all persons in the vicinity. Boiler rooms, kitchen installations, laboratories, transformer rooms, and medical installations that have a high risk of fire should be situated in separate, fire-resistant localities.

Special precautions should be taken in worksites where processes or materials are susceptible to extremely rapid burning, toxic fume emission, or explosions in the event of a fire.

Precautions may include the display of visible warnings such as signs prohibiting smoking or forbidding the bringing of open flames or sources of ignition into the area.

The employer should ensure that workers are adequately trained in the use and operation of fire extinguishing devices provided at the workplace. All equipment, devices, and warning signs should be regularly checked and maintained.

Fire exits should be accessible and free at all times. These exits should be clearly marked and able to be opened from the inside.

## **FURTHER INFORMATION**

Standards:

American Standard NFPA 12 (National Fire Protection Association)

AS 1668. The use of Mechanical Ventilation and Air Conditioning in Buildings

Gestal Otero, Juan Jesus. Riesgos del trabajo del personal sanitario. Editorial. Madrid, España.

## **4.20 SAFE ENTRY AND EXIT**

Safe means of entry and exit should be provided throughout the workplace. All access and exit routes should be free of obstructive material and properly maintained. Safe access should allow all persons, including the disabled, to move through the entire establishment easily and safely and while performing their regular tasks. Marked aisles and hallways facilitate the identification of access routes.

In case of emergency, safe and rapid exits out of the building must be provided. Appropriate access to the establishment's service and maintenance areas, machinery, and buildings also should be provided.

Floors should be level, obstacle-free, and slip-resistant. All doors and other means of entry and exit in the worksites should be kept unlocked and free from any obstacles while there are workers present. If the doors must be locked for security reasons, they should be able to be opened from the inside without a key to ensure a quick exit at any time.

Refrigerator or freezer rooms, sentry boxes and similar confined spaces should have effective means of safe entry and, especially, exit.

When necessary, steps, stairs and ramps should be furnished with handrails and other means to avoid slipping. Bars and fences should enclose floor openings and wells and adequate signs should warn about these potential hazards. Mezzanines also require netting or fencing, handrails and foot rails.

Doorways, hatchways, and openings used for hoisting or moving goods or materials up and down in the workplace should have secure netting and handholds.

Basements over 100m<sup>2</sup> in area require at least two safe accesses far away from each other.

Skylights and low windows in multistory buildings should be glazed with unbreakable material or fitted with guardrails to prevent falls.

In case of a likelihood of a person walking against or hitting the glazing, protective barriers should be installed. Clear glazing should be marked with signs for easy identification and warning and all doors should be appropriately and easily identifiable.

## **FURTHER INFORMATION**

Standards:

AS/NZS 1657: 1992 Fixed Platforms, Walkways, Stairways, and Ladders - Design, Construction and Installation

EN115: 1983 Safety rules for the Construction and Installation of Escalators and Passenger Conveyors

NZS 3609: 1978 Specification for Timber Ladders

NZS 4121: 1985 Code of Practice for Design for Access and Use of Buildings and Facilities by Disabled Persons

NZS 4223 Glazing Code (3 parts)

NZS 5235 Code of Practice for Safety in Mechanical Refrigeration (2 parts)

New Zealand OSH Publications:

Approved Code of Practice for Power-operated Elevated Work Platforms

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Safe Access

Safety in Confined Spaces

## **4.21 HALLWAY SIGNS, COLOR CODING, AND SIGNALING**

Appropriate warning signs should be provided in areas where hazards do not have readily apparent signs. These signs should be positioned so as to ensure visibility to all those who work in, or come into, the area. Hazards that require such precautions include:

- biological hazards (biosecurity),
- chemical hazards,
- risks to the eyes,
- the hazard of falling objects,
- hazards to the feet,
- hazards caused by hot process,
- ionizing hazards,
- machinery hazards,
- noise hazards,
- radiation hazards,
- refrigeration hazards, and
- traffic hazards.

Additional signs may be used to indicate designated areas and exit accesses provided for, for example, disabled persons.

The provision of signals in itself is not a means for hazard control but rather a component of a control system.

Color coding may be used to indicate hazardous and nonhazardous ducts and pipelines, special areas, equipment, first aid and fire extinguishing installations, traffic areas, process areas, storage areas, including specific colors for containers, drums, etc.

Signs in hallways may be used to show driveways, access ways, walkways, storage areas, fire extinguishing devices, etc.

### **FURTHER INFORMATION**

Standards:

NZS 4121: Disabled Persons, For Access to Buildings

NZS 5807: Code of Practice for Industrial Identification by Color, Wording or Other Coding

NZS 5807C Poster

NZS 5842: Water Safety Signs

NZS/AS 1319: Safety Signs for the Occupational Environment

New Zealand OSH Publications:

Safe Stacking and Storage

Guidelines for Safety at Work - What Every Employee Should Know

## **4.22 RESTRICTING EMPLOYMENT OF YOUNG PERSONS**

### **a) Hazardous Work**

No employer should hire persons younger than 16 years of age at health care facilities if such work is likely to cause damages to the health and safety of children and young persons (R190: Worst Forms of Child Labour Recommendation, ILO 1999).

Persons under 16 years of age may visit health care facilities under the direct supervision of an adult or in a guided tour with prior permission of the person responsible for the operation.

### **b) Night Work**

The employer should take all necessary steps to ensure that no person under 16 years of age will work between 10 p.m. and 6 a.m. except when employment conditions have been approved in accordance with a code of practice relating to the particular type of work or the particular job description (C79: Night Work of Young Persons (Non-Industrial Occupations) Convention, ILO 1946).

## **4.23 PROTECTIVE CLOTHING AND EQUIPMENT**

Management should provide all workers involved in any process or activity associated with risk of accident or other adverse health effect with protective equipment and clothing necessary for the reasonable protection against these risks and dangers at health care facilities.



All protective equipment and clothing should comply with relevant standards to ensure that they provide the protection they are intended for (see below). Personal protective clothing or items should be considered as the last option when engineering and administrative controls cannot completely eliminate or isolate the hazard at its source. “Protective clothing” refers to clothing that provides protection to its wearer against one, or several, of the following hazards:

- liquids, gases, vapors, dusts, powders, toxins and other similarly dangerous elements;
- Bodily fluids of patients or air that may be contaminated with hazardous microorganisms (gloves, masks, respirators, etc. are examples of protective clothing against these hazards);
- hazardous radiation (both ionizing and nonionizing);
- extreme temperatures outside the normal ambient range;
- impacts, vibrations, abrasions, cuts, etc.;
- poor visibility;
- falls or slips; and
- electrical hazards.

Workers should be trained in the use and maintenance of any protective clothing and equipment that they need to use.

Regular checks, maintenance and replacement of defective clothing are necessary. Adequate storage of the protective clothing will help ensure hygiene and ready accessibility. Protective clothing and equipment of a personal nature, such as hearing protection or footwear, need be provided on an individual basis.

Purchases should consider individual needs. Thus, the bulk purchase of a model hearing protection device does not ensure effective protection for all.

The effectiveness of protective clothing and equipment should be regularly assessed by monitoring the health and safety of the workers in relation to the hazard.

Supervisors should make sure that workers use protective clothing and personal protection as often as the circumstances they are provided for arise.

Tool 15 in the last section of this Manual provides an unfinished table on personal protectors and the task it is intended for.

When there are authorized visitors in the workplace and the conditions require a particular use of protective clothing or equipment, management is responsible for making the protective clothing or equipment available to the visitors by the same standards that are applied to the workers. This would be the case for family members who enter intensive care rooms or other spaces of high complexity, restricted access, and tight safety control.

## **FURTHER INFORMATION**

### Standards:

AS 2865: 1995 Safe Working in a Confined Space

AS/NZS 1715: 1994 Selection, Use and Maintenance of Respiratory Protective Devices

AS/NZS 1716: 1994 Respiratory Protective Devices

AS/NZS 1337: 1992 Eye Protectors for Industrial Applications

NZS 2264: 1970 and 5806: 1980 Specifications for Industrial Safety Helmets

NZS 5845: 1989 Specifications for Industrial Safety Footwear

NZS 5811: 1981 Industrial Safety Belts and Harnesses

NZS 5812: 1982 Industrial Protective Gloves

NZS 5827: 1988 Industrial Overalls

NZS 5839: 1986 High Visibility Garments and Accessories

### New Zealand OSH Publications:

A Guide to Respirators and Breathing Apparatus

Safety in Confined Spaces

List of Graded Hearing Protectors, October 1996

Manual Handling Guidelines for the Workplace

Safety at Work - What Every Employee Should Know

Safety with Corrosive Chemicals

### Other Publications:

Safeguard Buyers' Guide to Workplace Health and Safety Products and Services

#### **4.24 RESPONSIBILITIES OF DESIGNERS, MANUFACTURERS, SUPPLIERS, AND SELLERS OF HEALTH INSTALLATIONS AND EQUIPMENT**

Health installation and equipment designers must take all necessary steps to ensure that designed equipment will be used exclusively at the workplace in a way that will not cause harm to anybody during its manufacture, use, or maintenance. The design process should incorporate ergonomic principles in planning of the placement of power controls.

When commissioning the manufacture of an installation or an equipment, the manufacturer should receive all necessary information about its intended use in order to determine its design, installation, and how it must be used, adjusted, maintained, repaired, dismantled, etc.

Manufacturers should ensure that the installations and equipment whose design was approved and that were subsequently manufactured are used for the purpose they were designed to and that their installation, use, adjustment, repair, cleaning, or dismantling causes no harm to anyone.

Manufacturers, suppliers, and vendors of equipment and machinery should provide to all buyers or contractors clear and understandable information on the use for which it was designed, manufactured, and tested, as well as information about its correct installation, use, adjustment, repair, cleaning, and dismantling.

#### **4.25 RESPONSIBILITIES OF DESIGNERS, MANUFACTURERS, SUPPLIERS AND SELLERS OF PROTECTIVE CLOTHING AND EQUIPMENT**

Designers of protective clothing and equipment must take all necessary steps to ensure that the design incorporates ergonomic principles and that, once manufactured and adequately utilized for the purpose it was designed for according to designer instructions, the garment or the equipment will provide adequate protection against the hazards it is intended to protect against.

The manufacturer should receive complete information on the use, adjustment, cleaning, maintenance, repair, and dismantling of the protective clothing or equipment according to the designer's instructions.

Manufacturers should ensure that any supplier or seller of protective clothing or equipment receives sufficient, clear, and understandable information about the clothing's or equipment's intended use as well as details about its installation, use, adjustment, cleaning, maintenance, repair, dismantling, and about any other relevant information.

Suppliers and sellers should ensure that any buyer or contractor of protective clothing or equipment receives sufficient, clear, and understandable information about the clothing's or equipment's intended use as well as the details of its installation, use, adjustment, cleaning, maintenance, repair, dismantling, and about any other relevant information.

Manufacturers, suppliers and sellers should ensure that protective clothing or equipment has been designed, manufactured, and tested for the intended use, installation, adjustment, repair, cleaning, and dismantling. They should also ensure that, in accordance with the designer's instructions, the clothing or equipment will provide adequate protection against the hazard which it is intended to shield against.

Manufacturers, supplier, and sellers of protective clothing and equipment should ensure that, whenever possible and practical, clothing and equipment are furnished with sufficient printed information about their intended uses. Similarly, they should provide information, in accordance with designer's instructions, about the correct installation, use, adjustment, repair, cleaning and dismantling of their products.

#### **FURTHER INFORMATION**

New Zealand OSH Publications:

OSH Handbook for Health and Safety Inspectors