

OCCUPATIONAL HEALTH SERVICES AT THE WORKPLACE

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I. INTRODUCTION

Despite the progress made in the improvement of working conditions and environment and the efforts undertaken by all those concerned with occupational safety and health, the workplace remains a hazardous environment. Occupational health hazards are common in many economic sectors and affect large numbers of workers. The number of work accidents and the incidence of occupational injuries and diseases are still too high worldwide. The ILO estimates show that each year about 200,000 workers lose their lives and as many as 120 million are injured or become ill as a result of work. Some 68-157 million new cases of occupational disease are caused by various exposures at the workplace and dangerous working conditions of which about 30-40 per cent may lead to chronic disease and about 10 per cent to permanent work disability. A large number of occupational diseases go undiagnosed and unreported.

To protect and promote the health of workers, an occupational health service has to meet the special needs of the enterprise it serves and the workers employed in it. With the enormous range and scope of industrial, manufacturing, commercial, agricultural and other economic activities, it is not possible to lay down a detailed programme of activity, a pattern of organization and conditions of operation for an occupational health service which should be suitable for all enterprises and in all circumstances.

The ILO Occupational Health Services Convention No.161, 1985, defines occupational health services as "services entrusted with essentially preventive functions and responsible for advising the employer, the workers and their representatives in the undertaking on the requirements for establishing and maintaining a safe and healthy working environment, which will facilitate optimal physical and mental health in relation to work, and the adaptation of work to the capabilities of workers in the light of their state of physical and mental health".

Provision of occupational health services means carrying out activities in the workplace with the aim of protecting and promoting workers' safety, health and well-being, as well as improving their working conditions and the working environment. These services are provided by occupational health professionals functioning individually or as part of special service units of the enterprise or of external services.

Occupational health practice is wider and consists not only of the activities performed by the occupational health service. It is multidisciplinary and multisectoral activity involving in

addition to occupational health professionals other specialists both in the enterprises and outside, as well as the competent authorities, the employers, workers and their representatives. Such involvement requires a well-developed and well-coordinated system at the workplace. The necessary infrastructure should include all the administrative, organizational and operative systems that are needed to conduct occupational health practice successfully and ensure its systematic development and continuous improvement.

II. BASIC FUNCTIONS

According to the ILO Occupational Safety and Health Convention No.155, (1981), and the ILO Occupational Health Services Convention No.161, (1985), the prime responsibility for health and safety of workers rests with the employers. The functions of an occupational health service are to protect and promote the health of workers, improve working conditions and the working environment and maintain the health of the enterprise as a whole by providing occupational health services to workers and expert advice to the employer on how to achieve the highest possible standards of health and safety in the interests of the particular working community of which it is a part.

The ILO Occupational Health Services Convention No.161 and its accompanying Recommendation No.171 envisage occupational health services as multidisciplinary, comprehensive and although essentially preventive, also allow for carrying out curative activities. The WHO documents calling for services for small-scale enterprises, the self-employed and agricultural workers encourage the provision of services by primary health care units. The documents described above and national laws and programmes recommend a stepwise implementation so that the occupational health activities can be adjusted to the national and local needs and prevailing circumstances.

Ideally, an occupational health service should establish a programme of activities adapted to the needs of the enterprise where it operates and perform its functions in accordance with it. The functions should be adequate and appropriate to the occupational hazards of the enterprise it serves, with particular attention given to the problems specific to the branch of economic activity concerned. The following represents the basic functions and most typical activities of an occupational health service.

1. Preliminary Orientation to the Enterprise

If occupational health services have not been previously provided or when new occupational health service staff members are recruited, a preliminary orientation to the occupational safety and health situation of the enterprise is needed. This involves the following steps:

a) Analysis of the type of production, which will indicate the types of hazards typical for the specific economic activity, work or occupation which therefore may be expected to be encountered in the enterprise and can help identify those that may call for special attention.

b) Review of problems that have been identified by occupational health professionals, management, workers or other specialists, and occupational health measures that have previously been undertaken at the workplace will indicate the perception of the problems by the

enterprise. This should include examination of reports of occupational health and safety activities, industrial hygiene measurements, biological monitoring data, etc.

c) Review of the characteristics of the workforce (i.e. numbers by age, sex, ethnic background, family relations, occupational classifications, work history and, if available, related health issues). This information will help to identify vulnerable groups and those with special needs.

d) Available data on occupational diseases and accidents and sickness absenteeism grouped, if possible, by department, occupation and type of work, causal factors and the type of injury or disease should be examined.

e) Data on working methods, chemical substances handled at work, recent exposure measurements and the numbers of workers exposed to special hazards are needed for the identification of the priority problems.

f) The knowledge by employees of occupational health problems, the extent of their training in emergency measures and first-aid, and the prospects for an effective occupational safety and health committee should be explored.

g) Finally, pending plans for changes in production systems, installation of new facilities, machinery and equipment, introduction of new materials and changes in the organization of work should be examined as a basis for changing the occupational health practice in the future.

2. Surveillance of the Working Environment

The quality of the working environment through compliance with safety and health standards has to be ensured by the surveillance at the workplace. According to the ILO Convention No.161, surveillance of the working environment is one of the main tasks of the occupational health services.

On the basis of the information obtained through the preliminary orientation to the enterprise, a walk-through survey of the workplace is conducted, preferably by a multidisciplinary occupational health team supplemented by employers' and workers' representatives. This should include interviews with managers, foremen and workers. When needed, special safety and hygiene, controls or ergonomic or psychological examinations can be performed.

Special checklists and guidelines are available and are recommended for such surveys. The observations may indicate a need for specific measurements which should be performed by specialists in occupational hygiene, ergonomics, safety engineering or psychology who may be members of the occupational health team of the enterprise or may have to be procured externally. Such special measurements or checks may be beyond the resources of small-scale enterprises which would have to rely on observations made during the survey supplemented by qualitative or, in the best case, by semi-quantitative data as well.

As a basic checklist for the identification of potential health hazards, the List of Occupational Diseases (amended 1980) appended to the ILO Employment Injury Benefits Convention No.121 may be recommended. It incorporates the major known causes of

occupational diseases and although its main purpose is to provide guidance for compensation of occupational diseases, it can also serve for their prevention. Additional ill-impairments and causal agents, not mentioned in the list, can be added according to national conditions.

The scope of surveillance of the working environment as defined by the ILO Occupational Health Services Recommendation No.171 is as follows:

- (a) identification and evaluation of the environmental factors which may affect the workers' health;
- (b) assessment of conditions of occupational hygiene and factors in the organization of work which may give rise to risks for the health of workers;
- (c) assessment of collective and personal protective equipment;
- (d) assessment where appropriate of exposure of workers to hazardous agents by valid and generally accepted monitoring methods;
- (e) assessment of control systems designed to eliminate or reduce exposure.

As a result of the walk-through surveys a hazard inventory should be prepared identifying each hazard inherent in the enterprise. This inventory is necessary for estimating a potential for exposure and suggesting control measures. For purposes of this inventory and to facilitate designing, implementing and evaluating of controls, hazards should be cross-classified by the risks they present for workers' health with acute or chronic outcomes and by the type of hazard, i.e. chemical, physical, biological, psychological or ergonomic.

Next step is a quantitative assessment of exposure which is necessary for more exact health hazard evaluation, measuring the intensity or concentration, the variation in time, the total duration of exposure, as well as the number of workers exposed. Measurement and evaluation of exposure are usually conducted by occupational hygienists, ergonomists and specialists in injury control. These are based on the principles of environmental monitoring and should include, where necessary, ambient monitoring to collect data on exposure in a given working environment, and personal exposure monitoring of an individual worker or a group of workers (e.g., exposed to specific hazards). Measurement of exposure is necessary whenever hazards are suspected or reasonably predictable and should be based on the completed hazard inventory combined with an assessment of work practices. Knowledge of potential effects caused by each hazard should be used to establish priorities for intervention.

The evaluation of health hazards in the workplace should be accomplished by considering the complete picture of exposures in comparison with established occupational exposure standards. Such standards are expressed in terms of permissible levels and exposure limits and are set up through numerous scientific studies correlating exposure with produced health effects. Some of them have become state standards and are legally enforceable according to national law and practice. Examples are Maximum Allowable Concentrations (MAKs-Germany), Maximum Allowable Concentrations (MACs-CCEE), Permissible Exposure Limits (PELs-USA). There are PELs for about 600 chemical substances commonly found in the workplace. There are also limits on TWA exposure, short-term exposure limits (STELs), ceilings(c), and for some hard conditions that might result in skin absorption.

Surveillance in the working environment includes monitoring both the hazardous exposures and the health outcomes. If exposure to hazards is excessive, it should be controlled regardless of outcome, and the health of exposed workers should be evaluated. Exposure is considered excessive if it approaches or exceeds established limits examples of which are given above.

Surveillance of the working environment provides information on the occupational health needs of the enterprise and indicates the priorities for preventive and control actions. Most of the instruments guiding occupational health services emphasize the need to carry out the surveillance before initiating the service, periodically during the course of the activities, and always when substantial changes in work or working environment have taken place.

The results obtained provide the necessary data to estimate whether preventive actions taken against health hazards are effective, as well as whether workers are placed in jobs adequate to their capacities. These data are also used by the occupational health service to ensure that reliable protection against exposures is maintained and to formulate advise on how to implement controls in order to improve the working environment. In addition, the accumulated information is used for epidemiological surveys, for the revision of permissible exposure levels, as well as for the evaluation of the effectiveness of the engineering control measures and other methods of various preventive programmes.

3. Informing the Employer, the Enterprise Management and Workers about Occupational Health Hazards

As information about potential workplace health hazards is obtained, it should be communicated to those responsible for implementing prevention and control measures as well as to the workers exposed to these hazards. The information should be as precise and quantitative as possible and it should describe the preventive measures being taken explaining what the workers should do to ensure their effectiveness.

The ILO Occupational Health Services Recommendation No.171 provides that in accordance with national law and practice, data resulting from surveillance of the working environment should be recorded in an appropriate manner and be available to the employer, the workers and their representatives or the safety and health committee where it exists. These data should be used on a confidential basis and solely to provide guidance and advice on measures to improve the working environment and the safety and health of workers. The competent authority should also have access to these data. They may only be communicated by the occupational health service to others with the agreement of the employer and the workers. Workers concerned should be informed in an adequate and appropriate manner of the results of the surveillance and should have the right to request the monitoring of the working environment.

4. Assessment of Health Risks

A conceptual model of the interaction between the workers and occupational hazards in the working environment consists of sources of hazards, an environment into which these hazards are released and the workers exposed to these hazards. Risks for workers' health are assessed against occupational exposure caused by occupational hazards encountered by them in the working environment and whenever the hazardous effects are observed or are expected, a

thorough assessment of the potential damage for workers' health must be carried out.

To assess occupational health risks, information from surveillance of the work environment is combined with information from other sources, such as epidemiologic research on particular occupations and exposures, reference values like occupational exposure limits and available statistics. Qualitative (e.g., is the substance carcinogenic) and, where possible, quantitative (e.g., what is the degree of exposure) data may demonstrate that workers face health hazards and indicate a need for preventive and control measures.

The steps in an occupational health risk assessment include:

- (a) identification of occupational health hazards (performed as a result of surveillance of the working environment);
- (b) identification of workers or group of workers exposed to specific hazards;
- (c) identification of individuals and groups with special vulnerabilities;
- (d) evaluation of available hazard prevention and control measures;
- (e) analysis of how the hazard may affect the worker (ways of entry and type of exposure, threshold limit values, dosage/response relationships, adverse health effects it may cause, etc.);
- (f) making conclusions and documenting the findings of the assessment;
- (g) periodic review and, if necessary, reassessment.

5. Surveillance of Workers' Health

Due to limitations of a technological and economic nature, it is often not possible to eliminate all health hazards in the workplace. It is in these circumstances that surveillance of workers' health plays a major role. It comprises many forms of medical evaluation of health effects developed as a result of workers' exposure to occupational health hazards.

The main purpose of health examinations is to assess the fitness of a worker to carry out certain jobs, to assess any health impairment which may be related to the exposure to harmful agents inherent in the work process and to identify cases of occupational diseases in accordance with national legislation.

Health examinations cannot protect workers against health hazards and they cannot substitute appropriate control measures which have the first priority in the hierarchy of actions. Health examinations help to identify conditions which may make a worker more susceptible to the effects of hazardous agents or detect early signs of health impairment caused by these agents. They should be conducted in parallel with surveillance of the working environment which provides information on potential exposure present in the workplace and is used by occupational health professionals to assess results obtained through health surveillance of the exposed workers.

Health surveillance of workers may be passive and active.

In case of passive health surveillance, ill or affected workers are required to consult occupational health professionals. Passive surveillance usually detects only symptomatic disease and requires that occupational health professionals be able to differentiate the effects of occupational exposures from the resembling effects of non-occupational exposures.

In case of active health surveillance, occupational health professionals select and examine workers who are at high risk of work-related disease or injury. It may be conducted under many forms, including periodic medical examinations for all workers, medical examinations for workers exposed to specific health hazards, screening and biological monitoring of selected groups of workers. Specific forms of health surveillance depend largely upon possible health effects resulting from a particular occupational exposure. Active surveillance is more appropriate for workers with the history of multiple exposures and those at higher risk for disease or injury.

Details about health surveillance are given in the ILO Convention No.161 and Recommendation No.171. These instruments specify that surveillance of workers' health should include, in the cases and under the conditions specified by the competent authority, all assessments necessary to protect the health of workers, which may include:

- (a) health assessment of workers before their assignment to specific tasks which may involve a danger to their health or that of others;
- (b) health assessment at periodic intervals during employment which involves exposure to a particular hazard to health;
- (c) health assessment on resumption of work after a prolonged absence for health reasons for the purpose of determining its possible occupational causes, of recommending appropriate action to protect the workers and of determining the workers' suitability for the job and needs for assignment and rehabilitation;
- (d) health assessment on and after termination of assignment involving hazards which might cause or contribute to future health impairment.

Evaluation of the health status of workers is of utmost importance when occupational health practice is initiated, when new workers are recruited, when new working practices are adopted, when new technologies are introduced, when special exposures are identified, and when individual workers display health characteristics that need follow-up. A number of countries have special regulations or guidelines specifying when and how health examinations should be carried out.

Pre-assignment (pre-employment) health examinations

This type of health assessment is carried out before the job placement of workers or their assignment to specific tasks which may involve a danger to their health or that of others. The purpose of this health assessment is to determine whether a person is physically and psychologically fit to perform a particular job and to ensure that his placement in this job will not represent a danger to his health or to the health of other workers. In most instances, a review of the medical history, a general physical examination and routine laboratory tests (e.g., simple

blood count and urinalysis) will suffice, but in some cases the presence of a health problem or the unusual requirements of a particular job will require extensive functional examinations or diagnostic testing.

There are a number of health problems that may make certain job hazardous either for the worker or incur a risk for public safety or that of other workers. For these reasons, it may be necessary, for example, to exclude workers with uncontrolled hypertension or unstable diabetes from certain hazardous jobs (e.g., air and sea pilots, drivers of public service and heavy goods vehicles, crane drivers). Colour blindness may justify an exclusion from jobs requiring colour discrimination for safety purpose (e.g., reading traffic signals). In jobs demanding a high standard of general fitness like deep-water diving, fire fighting, police service and aircraft piloting, only workers able to meet the performance requirements would be acceptable. A possibility that chronic diseases may be aggravated by the exposures involved in a particular job should also be considered. It is essential, therefore, that the examiner have a detailed knowledge of the job and the work environment and be aware that standardized job descriptions may be misleading.

After finishing a prescribed health assessment, the occupational physician should communicate the results in writing to both the worker and the employer. These conclusions should contain no information of a medical nature. They should contain a conclusion about the fitness of the examined person for the proposed or held assignment and specify the kinds of jobs and the conditions of work which are medically contra-indicated either temporarily or permanently.

The pre-employment medical examination is important to the worker's subsequent occupational history since it provides the necessary clinical information and laboratory data on the worker's health status at the moment of entering the employment. It also represents an indispensable baseline for the subsequent evaluation of any changes in health status which may occur later on.

Periodic health examinations

These are performed at periodic intervals during the employment which involves exposure to potential hazards that could not be entirely eliminated by preventive and control measures. The purpose of periodic health examinations is to monitor the health of workers during the course of their employment. It aims at verifying workers' fitness in relation to their jobs and at detecting as early as possible any sign of ill-health which may be due to work. They are often supplemented by other examinations in accordance with the nature of hazards observed.

Their objectives include:

- (a) identifying as early as possible any adverse health effects caused by work practices or exposures to potential hazards;
- (b) detecting the possible onset of an occupational disease;
- (c) verifying whether the health of an especially vulnerable or chronically ill worker is being adversely affected by the work or the work environment;

(d) monitoring personal exposure with the help of biological monitoring;

(e) checking the effectiveness of preventive and control measures;

(f) identifying possible health effects of changes in the working practices, technology or substances used in the enterprise.

These objectives will determine the frequency, content and methods of the periodic health examinations. They may be conducted as frequently as every one to three months or every few years depending on the nature of the exposure, the biological response expected, the opportunities for preventive measures and the feasibility of the examination method. They may be comprehensive or limited to just a few tests or determinations. Special guidelines on the purpose, frequency, content, and methodology of these examinations are available in a number of countries.

Return to work health examinations

This type of health assessment is required to authorize the resumption of work after a long absence for health reasons. This health examination determines the workers' suitability for the job, recommends appropriate actions to protect them against future exposures, and identifies if there is a need for a reassignment or a special rehabilitation.

Similarly, when a worker changes his job, the occupational physician is required to certify that the worker is fit to carry out new duties. The objective of the examination, the need and the use of the results determine its content and methods and the context in which it is performed.

General health examinations

In many enterprises, general health examinations may be performed by the occupational health service. They are usually voluntary and may be available to the entire workforce or only to certain groups determined by age, length of employment, status in the organization, etc. They may be comprehensive or limited to screenings for particular diseases or health risks. Their objectives determine their frequency, contents and methods used.

Health examinations after the ending of service

This type of health assessment is performed after the termination of assignment involving hazards which could cause or contribute to future health impairment. The purpose of this health assessment is to make a final evaluation of workers' health, compare it with previous medical examinations and to assess how the prior job assignments may have affected their health.

General observations

The following general observations which are summarized below apply to all types of health examinations.

Health examinations of workers should be conducted by professionally qualified personnel trained in occupational health. These health professionals should be familiar with the physical requirements of work in the enterprise, experienced in using appropriate medical examination techniques and instruments, as well as in keeping correct record forms.

The health examination is not a substitute for action to prevent or control hazardous exposures in the working environment. If prevention has been successful, fewer examinations are needed.

All data collected in connection with health examinations are confidential and should be recorded by the occupational health service in a personal confidential health files. Personal data relating to health assessments may be communicated to others only with the informed consent of the worker concerned. When the worker wishes the data to be forwarded to his personal physician, he provides a formal permission for this.

Conclusions about the suitability of a worker for a particular job or about the health effects of the job should be communicated to the employer in a form that does not violate the principle of the confidentiality of personal health data.

Use of health examinations and their results for any kind of discrimination against workers cannot be tolerated and must be strictly prohibited.

6. Initiatives for Preventing and Control Measures

Occupational health services are responsible not only for the evaluation of potential risks for the health of workers but also for providing advice on preventive and control measures which will help to avoid them.

After analysing the results of surveillance of the working environment, including where necessary workers' personal exposure monitoring, and the results of workers' health surveillance, including where necessary the results of biological monitoring, occupational health services should be in a position to assess possible connections between the exposure to occupational hazards and resulting health impairments and to propose appropriate control measures to protect workers' health. These measures are recommended together with other technical services in the enterprise after consulting the enterprise management, employers, workers or their representatives.

Control measures should be adequate to prevent unnecessary exposure during normal operating conditions as well as during accident and emergencies. Planned modifications in the working processes should also be taken into account and recommendations should be adaptable to future needs.

Measures of control of health hazards are used to eliminate occupational exposure or reduce it to permissible limits. They include positive engineering, engineering controls in the working environment, human behaviour controls, personal protective equipment, integrated control and others.

The formulation of recommendations for control measures is a complicated process that includes the analysis of information on existing health risks in the enterprise, the consideration

of occupational safety and health requirements and occupational exposure standards, also involves the examination of technical feasibility, costs, benefits, alternative decisions and approaches, as well as the attitudes of the employers and workers.

The ILO instruments include a requirement that the employers, workers and their representatives should cooperate and participate in the implementation of such recommendations. They are usually discussed by the safety and health committee at large-scale enterprises or in smaller enterprises by the representatives of the employers and workers. It is important to document the proposed recommendations so that there can be a follow-up of their implementation. Such documentation should emphasize the responsibility of management for preventive and control actions at the enterprise.

7. Advisory Role

Occupational health services have an important task to perform by providing advice to the enterprise management, the employers, the workers, and health and safety committees in their collective as well as individual capacities. This needs to be recognized and used in the decision-making processes as it often happens that occupational health professionals are not directly involved in the decision-making.

The ILO Occupational Health Services Convention No. 161 and Recommendation No. 171 promote the advisory role of occupational health professionals in the enterprise. To promote the adaptation of work to the workers and improve working conditions and environment, occupational health services should act as advisers on occupational health, hygiene, ergonomics, collective and individual protective equipment to the employers, the workers and their representatives in the enterprise, and to the safety and health committee and should collaborate with other services already operating as advisers in these fields. They should advise on the planning and organization of work, the design of workplaces, on the choice, maintenance and condition of machinery and other equipment, as well as on the substances and materials used in the enterprise. They should also participate in the development of programmes for the improvement of working practices, as well as in the testing and evaluation of health aspects of new equipment.

Occupational health services should provide workers with personal advice concerning their health in relation to work.

Another important task is to provide advice and information related to the integration of workers who have been victims of work accidents or diseases in order to help them in their rapid rehabilitation, protect their working capacity, reduce absenteeism and to restore good psychosocial climate in the enterprise.

Educational and training activities are closely linked to the advisory task that occupational health professionals perform vis-a-vis the employers and workers. They are of particular importance when the modification of existing installations or the introduction of new equipment are envisaged, or there may be changes in the layout of workplaces, workstations and in the organization of work. Such activities have an advantage when started at the right time because they provide for better consideration of human factors and ergonomic principles in the improvement of working conditions and environment.

Technical advisory services at the workplace constitute an important preventive function of occupational health services. They should give priority to the awareness of occupational hazards and to the involvement of the employers and workers in hazard control and the improvement of the working environment.

8. First-Aid Services and Emergency Preparedness

The organization of first-aid and emergency treatment is a traditional responsibility of occupational health services. The ILO Convention No.161 and Recommendation No.171 stipulate that the occupational health service should provide first-aid and emergency treatment in cases of accident or indisposition of workers at the workplace and should collaborate in the organization of first-aid.

This covers preparedness for accidents and acute health conditions in individual workers, as well as readiness for the response in collaboration with other emergency services in cases of serious accidents affecting the entire enterprise. Training in first-aid is a primary duty of occupational health services and the personnel of these services is among the first to respond.

The occupational health service should make appropriate preliminary arrangements for ambulance services and with community fire, police and rescue units and local hospitals in order to avoid delays and confusion that may threaten the survival of critically injured or affected workers. These arrangements, supplemented by drills when feasible, are particularly important in preparing for major emergencies such as fire, explosions, toxic emissions and other catastrophes that may involve many individuals in the enterprise as well as in the neighbourhood and may result in a number of casualties.

9. Occupational Health Care, General Preventive and Curative Health Services

Occupational health services may be involved in the diagnosis, treatment and rehabilitation of occupational injuries and diseases. The knowledge of occupational diseases and injuries coupled with the knowledge of the job, the working environment and occupational exposures present in the workplace enable the occupational health professionals to play a key role in the management of work-related health problems.

According to the scope of activities and as required by national legislation or based on national practice, occupational health services fall into three main categories:

(a) occupational health services with essentially preventive functions, including mainly workplace visits, health examinations and the provision of first-aid;

(b) occupational health services with preventive functions supplemented by selective curative and general health care services;

(c) occupational health services with a wide range of activities including both preventive and comprehensive curative and rehabilitation activities.

The ILO Occupational Health Services Recommendation No. 171 promotes the provision of curative and general health care services as functions of occupational health

services where they are found to be appropriate. Based on national legislation and practice, the occupational health service may undertake or to participate in one or more of the curative activities with regard to occupational illnesses:

- (a) treatment of workers who have not stopped work or who have resumed work after an absence;
- (b) treatment of workers with occupational diseases or health impairments aggravated by work;
- (c) treatment of victims of occupational accidents and injuries;
- (d) medical aspects of vocational re-education and rehabilitation.

The provision of general preventive and curative health care services includes the prevention and treatment of non-occupational illnesses and other relevant primary health care services. Usually, general preventive health care services include immunizations, maternity and child care, general hygiene and sanitary services, whereas general curative health care services include conventional general-practitioner-level practice. Here, the ILO Recommendation No.171 prescribes that the occupational health service may, taking into account the organization of preventive medicine at the national level, fulfil the following functions:

- (a) carry out immunizations in respect of biological hazards in the working environment;
- (b) take part in campaigns aimed at the protection of workers' health;
- (c) collaborate with the health authorities within the framework of public health programmes.

Occupational health services set up by large enterprises, as well as those operating in remote or medically underserved areas, may be called upon to provide general non-occupational health care not only for workers but for their families as well. The extension of such services depends on the infrastructure of the health services in the community and on the capacity of the enterprises. When industrial enterprises are established in poorly developed areas, it may even be expedient to provide such services together with occupational health care.

In some countries, occupational health services provide ambulatory treatment during working hours which is normally prescribed by a general practitioner. It usually concerns simple forms of treatment or may be the case of more comprehensive medical care if the enterprise have an agreement with the social security or other insurance institutions providing the reimbursement of the cost of workers' treatment.

10. Rehabilitation

The participation of occupational health services is particularly crucial in guiding workers' rehabilitation and their return to work. This is becoming more and more important owing to a large number of occupational accidents in developing countries and the ageing of the working populations in industrialized societies. Rehabilitation services are usually provided by

external units which may be free-standing or hospital-based and staffed by rehabilitation specialists, occupational therapists, vocational counsellors, etc.

There are some important aspects concerning the participation of occupational health services in the rehabilitation of injured workers.

First, the occupational health service may play an important role in seeing that workers recovering from injury or disease are referred to them promptly. It is greatly preferable, when practicable, for a worker to return to his original place of employment, and it is an important function of the occupational health service to maintain contact during the period of incapacity with those responsible for treatment during the acute stages in order to identify the time when a return to work can be envisaged.

Second, the occupational health service can facilitate an early return to work by collaborating with the rehabilitation unit in planning. Its knowledge of the job and work environment will be helpful in exploring the possibilities of modifying the original job (e.g., changes in work assignment, limited hours, rest periods, special equipment, etc.) or arranging an alternative temporary substitute.

Finally, by following the worker's progress, the occupational health service can keep management informed of the probable duration of absence, limited capacity or the extent of any residual disability so that arrangements for alternative staffing may be made with minimal impact on production schedules. On the other hand, the occupational health service maintains a link with the workers and often with their families facilitating and better preparing their return to work.

11. Adaptation of Work to the Worker

To facilitate the adaptation of work to the workers and improve the working conditions and environment, occupational health services should advise the employer, the workers and the safety and health committee in the enterprise on matters of occupational health, occupational hygiene and ergonomics. Recommendations may include modifications of the job, the equipment and the working environment that will allow the worker to perform effectively and safely. This may involve reducing the physical workload for an aging worker, providing special equipment for workers with sensory or locomotor impairments or fitting equipment or work practices to the anthropometric dimensions of the worker. The adaptations may be required temporarily in the case of workers recovering from an injury or disease. A number of countries have legal provisions requiring workplace adaptations.

12. Protection of Vulnerable Groups

The occupational health service is responsible for recommendations that will protect vulnerable groups of workers such as those with hypersensitivities or chronic diseases and those with certain disabilities. This may include selection of a job that minimizes adverse effects, provision of special equipment or protective devices, prescription of sick leave, etc. The recommendations must be feasible in the light of the circumstances in a particular workplace and workers may be required to undertake special training in appropriate working practices and the use of personal protective equipment.

13. Information, Education and Training

Occupational health services should play an active role in providing relevant information and organizing education and training in relation to work.

The ILO Occupational Health Services Convention No. 161 and Recommendation No. 171 provide for the participation of occupational health services in designing and implementing programmes of information, education and training in the field of occupational safety and health for the personnel of the enterprise. They should participate in the progressive and continuing training of all workers in the enterprise who contribute to occupational safety and health.

Occupational health professionals can help increase workers' awareness of occupational hazards to which they are exposed, discuss with them existing health risks, advise workers' on the protection of their health, including protective measures and proper use of personal protective equipment. Every contact with workers offers an opportunity to provide useful information and to encourage healthful behaviour in the workplace.

Occupational health services should provide all information on occupational hazards present in the enterprise as well as on safety and health standards relevant to local situation. This information should be written in a language understandable by the workers. It should be provided on a periodic basis and especially when new substances or equipment are being introduced or changes are being made in the working environment.

Education and training can play a key role in the improvement of working conditions and environment. Efforts to improve safety, health and welfare at work are often substantially limited due to lack of awareness, technical expertise and know-how. Education and training in specific fields of occupational safety and health and working conditions can facilitate both the diagnosis of problems and the implementation of solutions and can therefore help overcome these limitations.

The ILO Conventions Nos. 155 and 161 and their accompanying Recommendations emphasize the key role of education and training in the enterprise. Training is essential to fulfil the obligations of both the employers and the workers. Employers are responsible for the organization of in-plant occupational safety and health training and workers and their representatives in the enterprise should fully cooperate with them in this respect.

Training in occupational safety and health should be organized as an integral part of the overall efforts for improving working conditions and environment and occupational health services should play a major role in this respect. It should aim at solving various problems affecting the physical and mental well-being of workers and should address the adaptation to technology and equipment, the improvement of working environment, ergonomics, working time arrangements, the organization of work, job content and workers' welfare.

14. Health Promotion Activities

There is some tendency to incorporate wellbeing promotion activities in the form of

occupational health programmes. These programmes are, however, essentially health promotion programmes that may include such elements as health education, stress management and assessment of health risks. They usually aim at changing personal health practices such as alcohol and drug abuse, smoking, diet and physical exercise with a view to improving overall health status and reducing absenteeism. Although such programmes are supposed to improve productivity and reduce health care costs, they have not been properly evaluated so far. These programmes, designed as health promotion programmes, are not usually considered as occupational health programmes, but as public health services delivered in the workplace, because they focus attention and resources on personal health habits rather than on the protection of workers against occupational hazards.

It should be recognized that the implementation of health promotion programmes is an important factor contributing to the improvement of the health of workers in the enterprise. In some countries, "health promotion in the workplace" is regarded as a separate discipline on its own and is carried out by completely independent groups of health workers other than occupational health professionals. In this case, their activities should be coordinated with the activities of the occupational health service whose staff can ensure their relevance, feasibility and sustainable effect. The participation of occupational health services in the realization of health promotion programmes should not limit the performance related to their main functions as specialized health services created to protect workers against harmful exposures and unhealthy working conditions in the workplace.

15. Data Collection and Record-keeping

It is important that all medical contacts, evaluations, assessments and surveys be properly documented and the records safely stored so that, if necessary for legal or research purposes, they may be retrieved years and even decades later.

The ILO Occupational Health Services Recommendation No.171 provides that occupational health services should record data on workers' health in personal confidential health files. These files should also contain information on jobs held by the workers, on exposure to occupational hazards involved in their work, and on the results of any assessment of workers' exposure to these hazards. Personal data relating to health assessments may be communicated to others only with the informed consent of the worker concerned.

The conditions under which and time during which records containing workers' health data should be kept, communicated or transferred and the measures necessary to keep them confidential, especially when these data are computerized, are usually prescribed by national laws or regulations or by the competent authority and governed by recognized ethical guidelines.

16. Research

According to the ILO Occupational Health Services Recommendation No. 171, occupational health services, in consultation with the employers' and workers' representatives, should contribute to research within the limits of their resources by participating in studies in the enterprise or in the relevant branch of economic activity (e.g., to collect data for epidemiological purposes). Occupational physicians involved in the implementation of research projects will therefore be bound by the ethical considerations applied to such projects. Research in the working environment may involve healthy "volunteers" and the occupational physician should

fully inform them about the purpose and the nature of the research. Each participant should give individual consent to the participation in the project. The collective consent provided by the workers' trade union in the enterprise is not enough. Workers must feel free to withdraw from the investigation at any time and the occupational physician should be responsible that they will not be subjected to undue pressure to remain within the project against their will.

III. LIAISONS AND COMMUNICATIONS

A successful occupational health service is necessarily involved in communications of many kinds.

Internal Collaboration

The occupational health service is an integral part of the productive apparatus of the enterprise. It must closely coordinate its activities with occupational hygiene, occupational safety, health education and health promotion, and other services directly related to workers' health when these operate separately. In addition, it must collaborate with all services in the operation in the enterprise: personnel administration, finance, employee relations, planning and design, production engineering, plant maintenance, etc. There should be no obstacles in reaching out to any department in the enterprise when issues of worker health and safety are involved. At the same time, the occupational health service should be responsive to the needs and sensitive to the constraints of all other departments. And, if it does not report to a most senior executive, it must have the privilege of direct access to top management in cases when important recommendations relating to workers' health are denied appropriate consideration.

In order to function effectively, the occupational health service needs the support of the enterprise management, the employer, workers and their representatives. The ILO instruments require the employer and the workers to cooperate and participate in the implementation of the organizational and other measures relating to occupational health services on equitable basis.

Occupational health services are established to protect and promote workers' health by preventing work injuries and occupational diseases. Many functions of occupational health services cannot be carried out without cooperation with workers. According to the ILO instruments, workers and their organizations should cooperate with occupational health services and provide support to these services in the execution of their duties.

Where a special plant-level programme for occupational health activities is to be established, the collaboration between the employer and the workers and the occupational health service is crucial in the preparation of such a programme and the activity report.

External Collaboration

Occupational health services should establish close relations with external services and institutions. Foremost among these are relationships with the public health care system of the country as a whole and the institutions and facilities in the local communities. This starts with at the level of primary health care units and extends to the level of hospital-based specialized services, some of which may also be providing occupational health services. Such relationships

are important when it is necessary to refer workers to specialized health services for appropriate evaluation and treatment of occupational injuries and diseases, and also to provide opportunities for mitigating the possible adverse effects of non-occupational health problems on attendance and work performance. Collaboration with public health and environmental health services is important. Inviting general practitioners and other health professionals to visit the occupational health service and familiarize themselves with the demands made on their patients by occupations or the hazards to which they are exposed will not only help to establish friendly relations, but also provide an opportunity to sensitize them to the particularities of occupational health issues that ordinarily would be ignored in their treatment of workers for whom they provide general health care services.

Rehabilitation institutes are a frequent collaborative partner particularly in the case of workers with handicaps or chronic disabilities who may require special efforts to enhance and maintain their work capacities. Such collaboration is especially important in recommending temporary job modifications that will accelerate and facilitate the return to work of individuals recovering from serious injuries or illnesses, both occupational and non-occupational aetiology.

Emergency response organizations and first-aid providers such as ambulance services, hospital outpatient and emergency clinics, poison control centres, police and fire brigades, and civic rescue organizations can ensure the expeditious treatment of acute injuries and illnesses and assist in the planning for and response to major emergencies.

Appropriate links with social security and health insurance institutions can facilitate the administration of benefits and functioning of workmen's compensation system.

The safety and health competent authorities and labour inspectorates are key collaborative partners for occupational health services. In addition to expediting formal inspections, appropriate relationships may provide support for internal occupational health and safety activities and offer opportunities to input to the formulation of regulations and methods of enforcement.

Participation in professional societies and in activities of educational/training institutes and universities is valuable for arranging continuing education for professional staff members. Ideally, the time and expenses should be subsidized by the enterprise. In addition, the collegial contacts with occupational health professionals serving other enterprises can provide strategic information and insights and may lead to partnerships for meaningful data collection and research.

The kinds of collaboration described above should be initiated from the very beginning of the operation of the occupational health service and be continued and expanded as appropriate. They may not only facilitate achievement of the objectives of the occupational health service, but may also contribute to the community and public relations efforts of the enterprise.