OCCUPATIONAL MEDICINE IN THE 21ST CENTURY

Occupational health in the USA in the 21st Century

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Comparative difficulty in the birth of the machine age is the perplexing reconfiguration of the United States' health care system. Paralleling the advances in medicine have been the divesting mergers and downsizing of industry, coupled with globalization, which have released millions of long-time workers. The labour contingent is changing, with the addition of great numbers of women and immigrant workers, and the manufacturing economy has become one of service and information. Serving the occupational health (OH) needs of such a force have been the professional societies of physicians, nurses, and industrial hygienists, with their members providing care in a broad variety of facilities. It is possible that a national organization, including all these disciplines, would have a greater voice in the protection of workers' health. Immediate leadership of an occupational health service (OHS) can be rotated among the disciplines, so that competition for primacy among the professionals would end. The new workforce demands culture sensitivity among OH personnel and polylingual capabilities may be demanded in the future. Management skills will be required of all in OH, and greater participation of employees in OH policy will characterize the decades ahead. Nearly neglected up to now, occupational mental health programming will be required to meet the real needs of workers, and to counter the move to outsource OH services, where little patient contact results. Behavioural safety, total quality management, and application of the rapidly developing technologies in health care will define the 21st century efforts in OH. Remaining issues, such as violence, telecommuting injuries, the inclusion of alternative medicine, and women's health, among others, will see carry-over for resolution into the year 2000.

Key words: future; industrial hygienists; millennium; occupational health; occupational health nurses; occupational medicine.

INTRODUCTION

The introduction of the machine to Britain, and the resulting Industrial Revolution, which occurred during the second part of the 18th and first part of the 19th centuries, has been equated with the building of Pandaemonium in John Milton's *Paradise Lost*, wherein the fallen angels set to work to mine, smelt, forge and mould the metals in the soil of hell. Currently, in the United States, a comparable, confused state is seen in the reconstruction of the health care industry. The system of healing the sick, which has remained unchanged for nearly two centuries, is undergoing efforts at reconfiguration, the rebuilding necessitated by the extraordinary costs attendant upon technological development in the medical arena.

Concomitant with advances in therapeutics, genetic identification, organ transplant, and body imaging, have been the unparalleled movements in industry, as seen in globalization, downsizing, mergers of huge corporations, the conversion of a manufacturing state to a service economy, and the massive outsourcing of innumerable work processes to countries abroad. Although the economy has flourished and the rate of unemployment is the lowest in decades, each month sees mass layoffs of employees, many of whom had years of service with their companies. In the last quarter of 1997, there were 1637 such layoff actions, resulting in the separation of 297,247 workers from their jobs for more than 30 days. A single layoff represents a discharge of 50 or more individuals. Reasons given for such separations include 'seasonal work,' 'contract completion,' and 'slack work'.

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In February 1998, some 81,381 persons were released, in 969 mass layoff actions. Manufacturing industries had the largest number of unemployment insurance claimants, at 37% of all individuals filing. Biennially, the Bureau of Labor Statistics of the U.S. Department of Labor updates its employment outlook for the coming decade. While it is not possible to extrapolate data to the next millennium, let alone the
next century, some trends are considered likely to evolve over the next several years. The labour outlook reflects swings in birth rate and a gradual playing out of the change in the 1940s–1980s work force when the numbers of employed women increased with the resulting social and economic changes. The large numbers of immigrants have counteracted the decline of population numbers and have led to growth of the labour force. By 2006, it is anticipated that the persons at work will number 149 million, an increase of about 15 million, or 11%. The force will age as baby-boom cohorts move to the 45–64-year-old segment. For the first time in 25 years, the number of younger workers (16–24 years) will be growing faster than the overall labour force. A decline in the next decade is expected in the 25–44 year age group.

By 2006, the proportion of working women will increase to 47.4% of the labour force, a slower rate of growth than in previous decades. The proportion of men in the labour force will decrease by 1.3%. The Hispanic group will become the second largest employed ethnic segment, outnumbering Blacks. Immigration is estimated for the future at 820,000 persons per year at the middle level, with a potential high assumption of 1.2 million immigrants per year. In essence, the labour force will be larger, younger, and with a different ethnic mix.

Economic growth is anticipated; both imports and exports are expected to near 20% of the gross domestic product. Investments will grow 50% faster than the overall economy, the changing being fuelled by the strong demand for computers and other high technology products.

The economy will add 18.6 million new jobs by 2006, in contrast to the 21 million increase in the previous 10 years, most of the growth to be seen in the service-producing sector, 3.6 million in business services, 3.2 million in health services, and 2.3 million in the retail trade. The structure of the economy will alter in its employment groups: the numbers of professionals, managers, and technicians, and service, marketing, and sales workers are expected to increase, while such occupational groups as administrative support, precision production, craft and repair, and fabricators, labourers and operators will decline. The most rapidly growing group is computer specialists, and half of the 30 fastest growing occupations are health care related. The changes here imply the need for a greater preparatory education.

CONTEMPORARY OCCUPATIONAL HEALTH
HUMAN RESOURCES

Three primary professional groups, representing distinct but often overlapping disciplines, are the American College of Occupational and Environmental Medicine (ACOEM), the American Association of Occupational Health Nurses (AAOHN), and the American Industrial Hygiene Association (AIHA). The memberships number as follows: ACOEM, 7136; AAOHN, 12,384; and AIHA, 12,500. While the American Conference of Governmental Industrial Hygienists (ACGIH) is a distinct occupational health society with 4935 members, its membership and that of the AIHA overlap to a great extent. While other groups are concerned with marketing, and subsections of large societies do devote their efforts to occupational health (OH), e.g. the American Public Health Association (APHA), essential policy guidance in OH is usually provided by the three membership groups indicated. These personnel are to be found in a broad variety of manufacturing facilities, the military, service organizations (e.g. insurance companies, banks, railways), research laboratories, free-standing clinics, retail chains, health maintenance organizations (HMO), public health installations, public utilities, institutes of occupational health, physical medicine and rehabilitation facilities, workers’ compensation authorities, and private consultant offices.

Several medical residency programmes are based in university medical schools or schools of public health, and specialty curricula for future occupational health nurses (OHN) and industrial hygienists are placed in teaching centers at both the undergraduate and graduate levels.

FORMATS IN CHARGE

For many decades following the 1916 formation of the organization now known as ACOEM, the primary delivery point of OH services (OHS) was an on-site facility at the particular company or plant desirous of having such services available at hand for their employees. While there are no data that can accurately identify the current worksite of many OH personnel, there has been a change from the traditional in-plant health unit to the utilization of community resources (OHSs in hospitals or medical centres or private clinics) or the intermittent assistance of private consultants. The downsizing of some corporations, the merging of others, the post-takeover and sale of some companies, and the move of manufacturing activities to countries with less-costly labour have eliminated some OHSs totally or have decreased the size of the health unit, or have led to external consultation. Accompanying this contemporary restructuring has been the growth of OH nursing, and the greater employment of occupational health nurses (OHNs) at plant sites, with many OHNs in managerial positions.

STRUCTURE

As indicated, the delivery of services is undergoing change, not only through utilization of extramural professional assistance, but through some deviation from the traditional hierarchical or authoritarian organizational format within the OHS. Usually, a physician, qualified in occupational medicine (a subspecialty of preventive medicine) has served as medical director, heading the OH personnel. Apart from OHNs and
industrial hygienists (IHs), the staff will include administrative, clerical, and technical workers. As determined by the size of the unit, there may be, in addition, epidemiologists, toxicologists, or directors of regional or international medical facilities.

Most articulate in the challenge to the contemporary organizational format have been nurses, who visualize their personnel as administrators or providers of primary care, replacing physicians in many settings. The industrial hygienists are seen as broadening their role in response to trends in business, labour, science, and technology. Their future involves a leadership role in oversight in the total environment, with global and international knowledge and concerns involving both standards and regulatory issues. Occupational physicians have been defined as being... first and foremost medical doctors with training in the provision of clinical care to patients. Additionally, OEM [occupational and environmental medicine] physicians have special expertise in the prevention, evaluation, and management of conditions that are either commonly or uniquely experienced by workers or persons exposed to hazardous environmental agents.

When comparing the objectives of the three primary OH associations, one finds essentially the same goals, all having expanded their endeavours to include the environment, be it that of the workplace, the local community, or the globe.

In light of the commonality of missions and the increased content of the educational or training curricula for credentials in the three OH professions, it is proposed that the future format follow the custom of many societal affiliations: have the larger OHSs with physicians, nurses, and industrial hygienists being directed by a group comprising the senior heads of the three professions, with a rotating chair person (one of the three) to serve as director for a specified period. Such a system permits the sharing of administrative responsibility and a fair opportunity for the testing and exercise of management skills.

THE NEW WORK FORCE

As indicated earlier, the conversion to a service economy and the influx of immigrants to the US have altered the composition of the employee body and the types of jobs presently seen in an information society. The diversity encountered throughout the country has transformed the provider—patient relationship as seen for decades in industry's OH services. With the great increase in workers from Spanish-speaking countries and Asia, and the moderate number of migrants from western Europe and the Middle East, it will be essential that all OH personnel become culture-sensitive in their delivery of care. Newcomers bring vastly different concepts of health care, and Western medicine is not readily accepted by many who have grown up with beliefs in folk medicine and who, at best, are difficult to dissuade from continuing such personal practices.

Each professional member of the OH team must be familiar with the health and behavioural canons of the country of origin, and respect the allegiance that the worker maintains. Staff members ideally will be bi- or polylingual, for it has been shown that for Spanish-speaking Latinos, having a physician who speaks their language resulted in better care. According to one study, 'discussions about complex medical issues require an advanced level of language that most non-native Spanish speakers have not achieved'. Recommended is the inclusion in the medical school curriculum of Spanish language classes, particularly in appropriate geographical areas (e.g. California), to boost physician—patient communication.

Concerning cancer screening, it was concluded that to be successful for Mexican—American women, the programmes must address not only access barriers, but also communication skills, knowledge, and, perhaps most importantly, anxiety. A comparable effort was undertaken with Asian Americans, where culturally sensitive means to disseminate information on cancer were evaluated. Although this population was 'reached', the barriers remaining were considerable—fear of cancer, belief that thinking about cancer could provoke onset of the disease, and finances. In the century ahead, polylingual staff members—identified in the same manner as are airline flight attendants—will be required to attain effective health goals.

Understanding cultural differences will be particularly applicable to those personnel of companies with installations abroad, for in those settings, many of the health or care practices, partially attenuated in the US, will be exercised to the fullest by both native employees and health care workers. The point of familiarity with cultural norms was emphasized in the preparation of the IH to operate globally. The cultural issues to be included in a profile of the country of assignment were:

- social taboos,
- major religions of the world, their beliefs and practices,
- the social status of castes, women, clergy, children, and other identifiable groups,
- how injury, illness, and medical care are handled socially, morally, and financially,
- US/European biases,
- legal issues, such as injury to the worker and the general public.

Professional meetings have wisely included topics relevant in OH practice with minority groups, with such titles as 'Affective Outreach in the Asian/Pacific Islander Community', 'The Native American Community', 'The Hispanic/Latino Communities', 'The African—American Community', and even, 'The Third Shift: Street Outreach to Transgender People'. The question has arisen involving an International Standardization of Occupational Health and Safety
MANAGEMENT SKILLS

An OH operation requires managerial skills in its leadership, be it a single professional on permanent assignment or, as already indicated, on a rotating basis, or a division or section chief in a large OHS. Training for a managerial position is standard in business schools, but nearly totally absent in the medical curriculum, or even in OM residencies. Irrespective of the professional lineage, learning to manage a group of employees is mandatory in today's health (or safety) settings.

In a review of the OH professional, research has demonstrated that such an individual often is neither manager nor medic, but some combination of the two. The ethical issue of allegiance is often raised, for the occupational physician does manage a company unit, representing the organization's interests. But he or she does serve employee-patients clinically, and often the solution to a particular problem may run counter to the employer's particular philosophy, or may prove costly. Managerial finesse is needed to resolve such ambivalent situations, and training in managerial functions will be seen in the decades ahead. Such skills are needed by OHNs, and some 34% of safety professionals have indicated that an industrial management course should be mandatory. The University of Southern California has introduced a Management Development Program for Physicians and the Mayo Clinic has provided its physicians with in-house leadership and management programming. The year 2000 will see this inclusion body in all OH preparatory curricula. The details are seen in ACOEM's listed competence in Management and Administration:

The OEM physician has the administrative and management knowledge and skills to plan, design, implement, manage, and evaluate comprehensive occupational environmental health programs ... that enhance the health, safety, and productivity of workers, their families, and members of the community.

INTEGRATION OF DISCIPLINES

With the commonality of objectives of the major disciplines in OH, it seems that the entire movement in the protection of worker health and the promotion of community well-being would be given added strength through a fusion of memberships. Nearly 25 years ago, thought was given to a coalition of interests in employee health, the suggestion being that '... it is time that there take place a coalescence of activity that will be strong enough to bring reality to proclaimed philosophy and a visible conjoint thrust to individual concern.' Although the concept did not materialize, it would seem logical in this age of mergers and cost savings that were ACOEM, AAOHN, AIHA, and ACGIH to combine efforts, a strong voice for OH would result which would carry greater weight in testimony before Congressional committees; a single authoritative journal representing all practice and research activities in OH; and a strong administrative support staff to serve a potential membership of nearly 37,000 professionals. While recognizing that medicine, nursing, and environmental hygiene do comprise variations in clinical, laboratory, field, managerial, academic, and research functions, the missions toward the common goal are comparable. In an effective OHS, the findings from the various disciplines as they relate to a single problem are usually merged to establish a method for resolving the problem.

Such an organization, the American College of Environmental Health, would embrace the efforts of the various involved disciplines and result in opinions of strength. Further, the minor, and occasionally major, disputes over position priority in the delivery of services would disappear. The APHA has, through some 24 sections (including occupational health and safety), and a membership of around 30,000 been able to project its goals with as divergent a membership as one that includes public health specialists, physicians, nurses, environmental scientists, epidemiologists, nutritionists, social workers, laboratory scientists, pharmacists, chiropractors, mental health specialists, industrial hygienists, dentists, podiatrists, health educators, statisticians, and optometrists. A single periodic publication, the American Journal of Public Health, brings monthly a variety of articles, all relating to public health, yet representative of the research of its broad membership. Such a new organization could have a global spread in its participation, as the ACOEM does presently. Irrespective of the exact titular designation, emphasis should be given to the elements of health, safety and the environment, components often suggested in the many attempts at renaming the AIHA.

EMLOYEE PARTICIPATION

Shared responsibility in the development and execution of an OH programme is necessary for an OHS to carry out its mission successfully. A means which has been used in an installation with trade union members, civil servants, employee association members, and a branch of the military, is the creation of an OH committee. The prospective members may be asked to serve, or the organizations composing the work force may be requested to appoint their representatives. The OH director serves as chairperson.
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up jointly by management and the employees.

• The conveyance of information concerning the OH

programme elements, so that the parent units may

have the opportunity of review.

• The solicitation of information concerning health or

safety problems either new or not known by the OH

authority.

• The report to the members of the outcome of

previously reviewed programmes.

• The acquaintance of the members with the rationale

for existing programme elements.

• The serving of the committee as an information trail
top management of plant problems peripheral to
the issues of OH, but bearing a degree of relation-

ship.

• The arranging, with representatives, of meetings with

their constituent units to cover specialized subjects
pertinent to those units, e.g. the introduction of a new,
hazardous substance in a certain workshop.

• The solicitation of opinions concerning certain

unsuccessful programme segments, and how attend-
dance or participation can be improved.

• The familiarization of the members with new federal,

state, or local legislation, or company rulings, that

affect the OH programme.

• The provision of an open court where opinions

concerning the actions or attitudes of certain OH

professionals can be aired and discussed.

• The interpretation of long-standing OSHA require-

ments, e.g. the Hazard Communication Standard, as

needed.

• The conveyance of information concerning the OH

programme, via the representative, to national head-
quarters, e.g. the parent trade union organization in

Washington, DC.

• The opportunity to emphasize certain OH policies or

philosophy, e.g. the confidentiality of medical records.

It is anticipated that in the decades ahead there will be

much greater employee representation in the determina-
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OCCUPATIONAL MENTAL HEALTH

Much of OH planning has been directed toward the

prevention of injury or illness of a particular workforce,
the emphasis being placed on physical or somatic
disorders. Only in recent times has the medical arm
become sensitive to the emotional problems of employ-

ees. In the previously cited competencies in occupational

and environmental medicine (OEM), the physician in

OM is expected to have certain clinical skills in several of
the specialties. Apart from identification of the severely
troubled employee, the OEM practitioner is expected to
recognize the psychologically impaired employee and
manage or refer the individual appropriately for counsel-

ling, through a community resource, which might be an
employee assistance programme (EAP). The facility
might be within the OHS, in-house on company premises, or can be extramural, with utilization by
several organizations.

Although this competence may be a ‘given’, there is
still lacking an aggressive, active effort to keep workers
who have emotional problems that affect their jobs and
lives adversely. In a recent poll by the Stanford
University Medical Center, older graduates were
surveyed. They were asked what area in their practice
was there inadequate preparation or that was one in
which the newer physician should be trained. The
response was almost unanimous in naming, as a lack,
the ability to identify the emotional problems of their

patients.

Included in the National Health Promotion and
Disease Prevention Objectives for the year 2000, were
occupational safety and health objectives, which were
tracked to 1997. Emphasis was essentially on work-
related injuries and illnesses; no attention was given to
behavioural causation or emotional problems in the
workforce. A priority area is devoted to mental health
and mental disorders in general, and the introductory
explanation of mental health applies immediately to
the work scene: ‘Mental health refers to an individual’s
ability to negotiate the daily challenges and social
interactions of life without experiencing undue emotional
or behavioral incapacity.' One counterbalancing movement, which will increase in both educational efforts and acceptance, is behaviour-
based safety. Although the concept that employee
behaviour is a critical factor in accidents and safety
performance dates back nearly 60 years, the relation-
ship is being given new attention. Psychologists are
promulgating the idea among safety engineers, most of
whom, in the past, have sought explanations for job-
generated injuries from other sources. In a conference
that was offered throughout 1998, the registrant is
offered these benefits, among others: learn how to
analyse safety-related behaviour and how to develop
strategies for improvement; and learn the basic principles
that shape behaviour, even seemingly illogical behaviours
that put workers at risk of injury. Not all persons
involved in safety programmes favour this approach, but
it is anticipated that its success will become known.
The principle has been applied to management in IH,
where it transposes safety from a hodgepodge of
programmes ... into a systematic process focusing on
behavior of managers, supervisors, and operating em-

ployees.

With this system making inroads into an occupational
area seeing its American entry in 1912, it should soon
permeate all OH programmes where job impairments
can be recognized, their behavioural aetiologies studied,
and appropriate remedial (psychotherapeutic) action
taken.

One of the late 20th century actions tending to negate
the search for behavioural deficits is a move referred to
earlier. It has been noted that the practising number of
IHs will decline, and there will be an increase in the
number of IH consultants. This outsourcing of professional guidance implies that as a problem arises, the extramural consultant will be called in, the problem reviewed, and a solution suggested. The daily contact with workers is lost, the rapport with an OHS no longer exists, and personal problems will not be brought to the surface by the emotionally ailing employee. The OH professional must be on the premises, seen in the cafeteria, talked to during shop visits, and must have knowledge of the worker’s family and home life. Without an established feeling of faith and confidence in a permanently based OHS, with its known personnel, behavioural problems will continue to bespoil the worker’s life and lose the advantage of early recognition and referral. Rapport with a visiting consultant is not possible, and from this view, the 21st century will not offer help to the worried employee, already on edge because of threatened mergers, downsizing, and movement of jobs abroad.

Downsizing brings with it low morale, high workload and sense of insecurity, increased absenteeism, greater utilization of sick-time benefits, increased injuries, increased work-related stress claims, lack of funding for safety initiatives, and, in general, a lack of appreciation of the employees who have kept up production despite the organizational changes. As mergers continue, it can be anticipated that behavioural problems among workers will increase, and there will be fewer skilled OH personnel on site to whom these affected employees can present their feelings. An excellent set of guidelines has been prepared for the occupational psychiatrist, but it is feared that with the continued reshaping of industry, this form of professional help will diminish in the decades ahead. That there is a need for direction in OM is seen in the UK, for example, where the Faculty of Occupational Medicine (FOM) has initiated a ‘Clinical Update Series’ under the heading of ‘ABC of Mental Health for Occupational Physicians.’ The first of the series carried articles on assessing mental health problems in the workplace, and legal aspects of mental health in the workplace. This type of professional education must be duplicated in the US, so that the emotional difficulties of employees can be identified and treated by the full-time personnel. Outsourcing fails to meet or support these needs.

QUALITY MANAGEMENT

Following the early introduction of the concepts of total quality management (TQM) in Japan following the conclusion of World War II, this management model has been adapted in innumerable organizations. The emphasis is on quality, and this effort must become the fundamental responsibility of all employees and must focus on problem prevention. A new belief system was created specifically for quality, which means conformance to customer requirements and specifications, fitness for use, buyer satisfaction, and value at an affordable price. Inherent in TQM are communication, cross-departmental cooperation in problem resolution, constant retraining, management commitment, and statistical control (possibly equivalent to audit).

Buyer satisfaction is readily translated to patient satisfaction, so that the entire concept is readily utilizable by an OHS, as evidenced in several publications. While the employee does not leave with a purchased product, there will be feelings concerning the care given and if the reaction is negative, word will spread throughout an organization and the OHS mission will be subject to failure. Recently, intercollegiate visits have been indicated as a mechanism for evaluating the elements of quality management of medical societies in the Netherlands. Plant visits by fellow practitioners are not uncommon in the US, and it is anticipated that such exchanges will increase in the future. TQM gives additional empowerment to employees in problem resolution, and the placement of such responsibility on the professional groupings within an OHS is entirely feasible, provided the director(s) of a unit are dedicated to this management style.

THE ACTION IN TECHNOLOGY

That the maintenance of a pace with today’s developments in technology can be difficult is minimizing actuality. The acceleration of electronic evolvement, in the eyes of one futurist, indicates that,

_In such a technologically driven society, not even the renowned information worker will be safe. Computers, automation, and intelligent systems, according to Knobe, are advancing so quickly that even in the professions and management, general practitioners and mid-level functionaries will join blue-collar workers and clerks among the displaced in increasing numbers._

One of the competencies needed by the OEM physician is to: ‘Determine management information needs and apply medical informatics, electronic health and patient care data, management information systems, and other computer technologies to an OEM programme.’

Electronic patient records have been developed and used in a variety of specialty practices. It is anticipated that, in the years ahead, provided more physicians are willing to utilize the system, more clinical installations will have computerized all records. In a sense, the OHS can be ‘paperless’. Electronic medical records have been utilized in ambulatory practice, with improvements being noted in the quality of medical care, the quality of patient service, the productivity within clinics, the quality of medical records, and the quality of work life among clinicians and administrative personnel. The conversion of traditional medical record components on paper to computer format can result in a variety of clinical annals. The Electronic Medical Record (EMR) contains ongoing information developed in the health care process, using the customary modalities of the keyboard, mouse, touch-screen, voice recognition device—sound recording device, or pen computing services.
DEVELOPING ISSUES

While advances in health care at the worksite will be made during the oncoming decades, certain elements in OH remain in a state of flux. Alternative medicine has made inroads into the standard modes of practice, patients utilizing contact therapies such as acupuncture or chiropractice, or ingesting herbal preparations or dietary supplements.

In one study, 50% of patients had or were using some form of complementary medicine, but only 53% informed their physicians about such use. Presumably, the majority of users chose these modalities not so much as a result of being dissatisfied with conventional medicine, but largely because they believed them to be more congruent with their own values, beliefs, and philosophical orientations toward health and life. OEM personnel must be familiar with these patient practices so that counsel can be given concerning local exponents of these methods and, where indicated, caution can be expressed regarding toxicity, personal sensitivity, and the like. At Stanford University, a complementary medicine clinic opened in April 1998 with programmes in group therapy, hypnosis, biofeedback, acupuncture, massage, meditation, and yoga. Evaluations are in progress.

Telecommuting as a work style has been adopted by 65% of Fortune 1000 companies. An unresolved question is that of injuries to an employee occurring on premises away from that of the employer, usually in the worker's home or occasionally in extramural, community work centres. Care should be exercised in the selection of personnel allowed to work away from a company's primary facilities. New work-stations must meet safety codes and the equipment provided must be ergonomically appropriate. The issues concerning injuries are still under review.

Violence and assaults at the workplace continue, and although many organizations have endeavoured to counter such actions, including multiple murders, teachers, postal workers, and health care workers continue to be at risk. The OHS, where available, must be in constant readiness to assist in the prevention of such morbidity and mortality, in the case of victims, and in the debriefing of fellow workers subsequent to an event.

In light of the changing patterns of health care and its management, there will be an increase in the treatment given employees presenting with non-occupational disorders. One of the competencies expressed for OEM physicians is to 'Evaluate and treat medical conditions commonly seen by a general medical practitioner.' In the past, there were limitations in such therapy at the OHS, but referrals of patients with readily treatable conditions were usually causative of both time and financial loss, and frequently disruptive of the work process.

Greater attention will be given women's health. Today, more than one half of adult women work and, in recognition of this factor, more female physicians will be seen in the OHSs of this country. Although the number of workplace homicides is higher among men, such killings are proportionately greater among women, accounting for almost half of women's job-related fatalities. The OHS will provide more health education and materials, including information on weight control, prenatal care, and cancer prevention.

In parallel with issues in the health of women workers are moves toward broadening the functions of an OHS. It is conceivable that the 21st century will see involvement of OEM personnel in child health, as 30 work-linked schools are located near the parents' worksite. In many instances, the schools are on employer's property. School nurses may be added to OHS staff. In a reflection of World War II activities, some OHSs may be given responsibility for child health care in company- or union-supported day care centres. Models for the continuation of this wartime accommodation have been seen in European OH facilities. A bill recently introduced in the US House of Representatives clarifies the issue of the inclusion of breastfeeding under the Pregnancy Discrimination Act. Employers are encouraged to set up 'safe, private, sanitary, lactation-friendly environments.' It is reasonable to assume assignment of responsibility for oversight to OH.

As rehabilitation increases for health-impaired children and more of these fragile youngsters enter school, it is expected that one day these same individuals, when grown, will enter the labour force. Such additions will demand greater knowledge of placement in keeping with the disability, and improved return-to-work programmes. There will be moves for more rapid rehabilitation of injured workers who receive care in the private medical sector. Managed care organizations must be apprised of individual job demands so that injury-absence periods are authorized in keeping with work requirements and not baseless, lengthy convalescence periods.
Finally, the design of work systems will take increasing age into account, so that job descriptions will cover all potential incumbents, not just the youthful entrant, free of any morbidity. With the ageing workforce, specialists in geriatrics may be needed.

UNRESOLVED PROBLEMS

Issues remaining unresolved, as foreseen currently, are substance abuse, AIDS, the provision of OH services to contractors and sub-contractors on site, the deployment of environmentalists to the battlefield so that problems such as Gulf War syndrome will be obviated in future conflicts, the extent of services to be offered to temporary workers, the application or non-application of genetic test findings to work applicants and/or employees, the lack of OH preparation for chemical or biological defence, the legality of child labour, illiteracy and minimal education in the workforce, and the lack of mandated OH services to all employees.

With increased communication by highly knowledgeable OH specialists, some of these deficits may see correction in the year 2000. Paul Kennedy, in his insightful book Preparing for the Twenty-First Century, ended his views of the future with these thoughts:

"The pace and complexity of the forces for change are enormous and daunting; yet it may still be possible for intelligent men and women to lead their societies through the complex task of preparing for the century ahead. If these challenges are met, however, humankind will have only itself to blame for the troubles, and the disasters, that could be lying ahead."

Is this level of leadership present among the American practitioners of occupational health?

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