LEGAL AND LEGISLATIVE ISSUES

LEGISLATION TO PROTECT WORKER CV HEALTH IN EUROPE *by Lennart Levi, MD, PhD*

The science-policy gap must be bridged, by issuing laws or decrees, agreeing on a code of practice, and educating and informing—measures based on an adequate range of scientific evidence. First, we need to consider if there is a problem to be addressed in terms of potentially noxious working conditions. If there is a problem, our second step is to review the present state of knowledge with regard to potentially noxious health effects of such conditions. If such effects are found to be likely and, in addition, qualitatively and/or quantitatively of sufficient severity, a logical third step is to discuss the need for, or existence of, legislative and other measures to modify or eliminate such conditions, in the 15 Member States of the European Union (EU) and elsewhere.

It is then up to you, the reader, to consider the applicability of these measures to the American scene.

Noxious Working Conditions?

In a major study of work conditions in the EU, which then comprised 12 Member States, the European Foundation for the Improvement of Living and Working Conditions found that 23 million workers had night work (more than 25% of their total hours worked); every third worker reported repetitive work; every fifth male and every sixth female worked under continuous time pressure; and 30% of the European workforce regarded their health at risk from work.[48]

The most recent set of representative European data come from the Second European Survey of Working Conditions, conducted by the European Foundation in early 1996. The report calls attention to the pronounced transformation of European working life from the industrial to the service sector, with a consequent change in job profile: introduction of new technology (one-third of the workforce uses computers) and more client-oriented jobs (49% indicate permanent and direct contact with clients or patients).[47] Work organization also has changed, with new management models, teamwork, just-in-time, and Total Quality management (TQM). In addition, European workers are getting older; they are working more often on fixed-term or temporary contracts; the proportion of female workers is growing rapidly; the traditional employee-employer relationship is slowly disappearing; and the unemployment rate remains very high.[47]

According to this survey, 45% of the 147 million workers in the EU Member States report having monotonous tasks; 44% no task rotation; 50% short, repetitive

tasks; 35% no influence on task order; and 28% no influence on work rhythm; while 54% work at a very high speed, and 56% to tight deadlines. Thus, a considerable proportion of the workforce is exposed to a variety of work-related stressors, with likely effects on health.[54]

Health Effects?

According to a recent state-of-the-art document from the European Heart Network, there is a marked difference in CVD risk between various occupational groups: a nine-fold difference between high- and low-risk occupations in men, and a five-fold difference among women.[13] These differences are too large to be explained by conventional risk factors; factors associated with the occupation, whether physical or nonphysical, must be involved. Some of the latter are work-stress–related.

Complementing the person-environment fit model, there are two current models for predicting stress and CVD risk at work. In the **demand-control-support model**, persons in jobs with high demands and little control over decisions are in a high job-strain situation and at a higher risk of CVD.[21] Low social support at work further increases the risk.[19] According to the **effort-reward model**, people who work hard (high effort) but receive little reward (money, esteem, or status control), experience an imbalance which puts them at increased risk of CVD. Persons with a high "need for control" over their situation who are in a high effort-low reward situation are at particularly high risk.[62] Shift work and night work also increase the risk for CVD. The risk intensifies with prolonged exposure. Exposure at work to carbon disulphide, nitroglycerin, nitroglycerol, carbon monoxide, passive smoking, and possibly lead also have been shown to increase the risk for CVD.

The European Heart Network has reviewed estimates of the proportion of CVD caused by work. According to such estimates, 16% of CVD cases in men and 22% in women could be prevented by eliminating all occupational risk factors from the work environment. Job strain accounts for 6% of this risk in men, 14% in women; shift work accounts for 7% in both sexes. Inclusion of sedentary work into the calculation raises the (preventable) proportion of CVD cases caused by work to around 50%.[13]

EU Legislation and Practice

Against this background, it is reasonable to consider legislative action or other practices to protect European workers against such potentially noxious exposures. In its report on European health promotion in the workplace, the World Health Organization draws attention to such actions because they could improve the quality of life for every worker, provide return for the company, and stimulate healthier lifestyles in the population as a whole.[74] Complementary strategies fall into five categories: (1) building healthy public policies; (2) creating supportive environments for health; (3) strengthening community action; (4) developing personal skills; and (5) reorienting health services.

The most important initiative is the EU's ambitious **Framework Directive** (89/391/EEC). Under this Directive employers have a "duty to ensure the safety and health of workers in every aspect related to the work, on the basis of the following general principles of prevention:

- Avoiding risks;
- Evaluating the risks which cannot be avoided;
- Combating the risks at their source;
- Adapting the work to the individual, especially as regards the design of workplaces, the choices of work equipment and the choice of working and production

musculoskeletal disorders (MSDs). The body of research linking work organization and musculoskeletal disorders is much smaller than the research on work organization and CVD, having begun later.[3,7,23,31,37] However, ergonomics is one of the few areas in which regulatory efforts have addressed issues of work organization and psychosocial job characteristics. These efforts have been general, sometimes inadvertent, and have met with considerable resistance. But they represent a first step to which future regulatory initiatives may refer.

Review of the Standards and Programs

California

The California Standard on Repetitive Motion Injuries (RMIs) is the only standard currently enacted.[11] Despite several challenges, it currently stands in its original 1997 wording (awaiting the results of a case on appeal). However, the standard is quite short (1 page) and limited, referring only to injuries "predominantly caused by a repetitive job, process, or operation." If more than one employee in a workplace has experienced an RMI, the standard requires establishment and implementation of a program including worksite evaluation, control, and training. The only wording relevant to work organization issues in this Standard is requirement that "the employer shall consider engineering controls . . ., and administrative controls, such as job rotation, work pacing, or work breaks." These simple aspects of work organization are seen only as factors that can affect intensity and duration of a biomechanical exposure. However, attention to these controls also could result in beneficial reductions of psychosocial stressors, such as job strain, by increasing job variety and control.

North Carolina

The Draft Ergonomic Standard for the State of North Carolina is similar in its approach.[41] Although the standard would require attention to a broader range of biomechanical stressors (called "ergo stressors") than the California standard, there is no reference to any psychosocial or work organization issues. Employers are required to solicit early reports of symptoms from employees. After a 30-day period that either allows temporary symptoms to subside or allows determinations of work-relatedness, the employer must implement controls to limit exposure "to the maximum extent practicable." Controls listed include engineering changes to the workstation and equipment, work practice controls, and administrative controls, primarily of the work hardening and exercise variety. The work practice controls include work breaks, job rotation, changing the order of work, and "changing the way work is done." This ambiguous last phrase, combined with the requirement that "the employer, *in consultation with the affected employee* (italics added), shall implement one or more of the . . . controls" seems to provide a limited arena in which employee control of the work process could be increased.

Washington

Although not a regulation, the Washington State Department of Labor has produced a valuable reference for employers, Fitting the Job to the Worker: An Ergonomics Program Guideline (1995). Given the possibility that nonmandatory program guides might someday serve as a basis for part of an ergonomic standard, the information is relevant. The main body of the document, outside of a strong recommendation to involve employees in all stages of the program, does not specifically address work organization or psychosocial stressors. However, "work rates" are identified as potential

stressors, including increased over-time and piecework. As in the state regulations, job rotation and rest breaks (low-level work organization changes) appear as possible controls. Appendix C does recommend self-pacing as a way to reduce high rates of repetition. Self-pacing also could increase work variety and possibly reduce job strain.

Appendix F, Psychosocial Risk Factors, begins by stating, "Psychosocial risk factors arise from the interaction of the individual (psychological) and the business' culture and attitudes toward employees (sociological)." It notes that these risk factors are difficult to incorporate into a program but "can be serious and costly in terms of employee discomfort, increased absenteeism, and loss of productivity." This guide is the only document that acknowledges that effects of psychosocial stressors can be both psychological and physical (specifically noting fatigue, heart rate changes, and changes in sleep or appetite). Employers are encouraged to consider controls specifically targeted towards psychosocial stressors: implementing procedural changes (not specified); listening to employees and providing regular positive feedback; soliciting employee input on changes that affect their work; ensuring adequate staffing and resources or reducing expectations; training to help reduce risk factors, including job design, stress reduction, and communication/interaction skills.

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI) Z-365

The draft ANSI Ergonomic Standard (1997, 1998) is a much more extensive document than the state standards. The first four sections tend to focus only on biomechanical workplace exposures. Section 2, Definitions, lays out an interesting distinction between psychosocial and work organization factors. Psychosocial factors are defined as work environment characteristics that affect interpersonal relationships (including the employee to the organization). By contrast, work organization factors receive a lengthy and very broad and useful definition, one that invites the reader to consider the multifactorial and multilevel assessment of risk for which recent research argues.[23,72,73] In part: "These factors broadly consider various aspects of job content (e.g., workload), organizational characteristics (e.g., tall vs. flat organizational structures), interpersonal relationships at work (e.g., supervisor-employee relationships), temporal aspects of the work and task (e.g., shift work, changing risk factor conditions such as equipment maintenance, raw materials and quality control), financial and economic aspects (e.g., pay, benefits), community aspects (e.g., prestige and status) and physical aspects of work (e.g., thermal or chemical exposure)."

However, this promising early entry in the standard does not appear again in the rest of the document. Elsewhere, the ANSI standard conceives of work organization factors as workplace characteristics that "can alter the characteristic properties or effects of physical stress exposure," such as magnitude, repetition, duration, and recovery time. Oddly, the proposed standard then proceeds: "It is not understood how to intervene with psychosocial and work organization factors." And later (in section 6.8.2.3): "It is not feasible in this standard to provide recommendations on specific work organization factors such as wage incentive systems or workplace conflict resolution." We are referred to the TQM literature. However, the standard does present a list of "specific work organization factors," which addresses aspects of job demands and job control (thus, by implication, heart disease risk) and, to an extent, supervisor support, but not coworker support, skill discretion, and larger issues like job security. The administrative controls presented in section 6.8.2. specifically recommend reducing these hazards: close performance monitoring, wage incentives, machine-paced work, absence of employee latitude in how the job is performed, time pressure and overload, unaccustomed work, overtime/extended work hours, and work allocation.

Finally, the ANSI Z-365 draft standard contains an extensive rationale for employee involvement in the ergonomic program, a blueprint for involvement in all phases, and mandatory language to ensure involvement. The range of involvement proposed does not by itself guarantee that employees will have substantial influence in the program, but it lays the ground rules within which that influence could evolve. Thus, even if work organization stressors are narrowly conceived as "altering the characteristic properties" of physical exposures, the control tactics and strategies recommended could be used to substantially alter some of the most stressful job characteristics, and thereby reduce the risk of heart disease.

OSHA 1995

More extensive and well thought-out references to work organization appeared in the 1995 OSHA Draft Ergonomic Protection Standard, which did not achieve standard status. In the mandatory portion of the standard, machine-paced work (a classic example of high job strain) is the only work organization variable that achieves entry into the checklist, and work organization is addressed only once in the body text, under "definitions." The definition notes six aspects of work organization, similar to those seen in the ANSI standard: inadequate work-rest cycles, excessive work pace and/or duration, unaccustomed work, lack of task variability, machine-paced work, and piece rate.

In the nonmandatory appendices, the standard presents extensive and thoughtful analysis of work organization factors, suggesting that physical "workplace risks can be intensified by work organization characteristics," a formulation similar to the first ANSI proposed mechanism. Appendices A and B contain a detailed review of several work organization risk factors and their ramifications. Unlike the ANSI standard, this document clearly proposes possible control tactics—tactics which could reduce exposure to job strain and thus CHD risk:

- Work recovery cycles—alternate task types, task cycles, introduce variation, change scheduling
- Excessive work pace—let employee set pace, especially in very demanding jobs, job rotation, no overtime for hard tasks unless redesigned, breaks
- Unaccustomed work—break-in periods, effective maintenance and repair
- Lack of task variability—increased recovery periods, alternate tasks, job enlargement, job rotation
- Changing postures
- Machine-paced work—self-paced is preferable, provide buffers, increase cycle time, provide adjustability of line speed ("Increases in line speed should be discussed with the workers on the line and the equipment suppliers to determine safety concerns.")
- Piece rate and incentive systems should be avoided if possible.

Addendum B-5 proposes the following:

- Provide clear job descriptions
- Avoid monotony, fast cycle times, low variety, and boring tasks
- Create clear and unambiguous lines of reporting—avoid conflicting supervision
- Train supervisors to manage and develop better interpersonal skills, to reduce tension
- Schedule work to avoid recurrent deadline stress—anticipate and communicate peak workloads; prepare work ahead in slack times.
- Avoid excessive overtime by replacing workers who are absent for extended periods of time.

• Communicate with workers about work monitoring practices to reduce tension.
• "Resolving organizational issues usually requires the involvement of people who frequently interact with the area. Problem-solving teams have been used successfully to develop creative solutions and to facilitate implementation."

Although this draft standard was never enacted, the review of work organization stressors (which are, of course, pertinent to CHD risk) and possible control tactics and strategies remains the most comprehensive attempt to date to regulate work organization risk factors.

OSHA 1999

By contrast, the 1999 OSHA Draft Ergonomics Program Standard, a much more restricted document, only mentions work organization at the very end, in its tables listing specific workplace conditions. The tables list three aspects of work organization: work recovery cycles, work rate, and task variability. The standard does not state the theoretical reasons for including these three factors, but they appear similar to the ANSI factors thought to increase the characteristics of exposure (duration, magnitude, etc.). Correspondingly, possible administrative controls for MSD risk in the draft include "employee rotation, rest breaks, alternative tasks, job task enlargement, redesign of work methods, and adjustment of work pace."

Probably of more import to the control of psychosocial stressors at work are the two basic elements in the ergonomics program requirement: (1) hazard identification and hazard awareness, and (2) management leadership and employee participation. The standard spells out employer responsibility for soliciting and aiding employee participation in hazard identification, developing control measures, training, and program evaluation. In the presence of committed management and labor organizations, these could be the conditions for a substantially altered psychosocial work organization in the company. However, nothing in the standard guarantees this level of employee influence.

OSHA Safety and Health Rule

Though not an ergonomic standard, the OSHA Draft Proposed Safety and Health Program Rule proposes to reduce work-related fatalities, illnesses, and injuries by requiring employers to establish a workplace safety and health program. This program would ensure compliance with OSHA standards and the General Duty Clause of the OSHA act. The elements of the program are almost an exact duplicate of the provisions in the Draft Ergonomics Program Standard, described above. Hence, the requirements for management leadership and employee involvement present the same set of reasons for hope and pessimism, concerning the possibility of reducing psychosocial stressors in the workplace.

Conclusions

It is not surprising that ergonomics is the one area in which regulatory efforts address issues of work organization. Ergonomics programs may be unique in recognizing the effect of work environment because the effect of poor work organization on musculoskeletal disorders is so apparent. The different standards and programs reviewed present different theoretical reasons for attending to work organization factors. In general, most documents use a limited definition, seeing negative work organization factors as altering the characteristics of physical (biomechanical) exposure (magnitude, duration, repetition, and recovery time, in the ANSI formulation). However, if an employee's control over the job is increased in the interests of

improving the rest schedule, this still represents increased decision latitude and has implications for reduced job strain beyond the reduction of MSDs.

Institution of an ergonomics program may itself be a positive psychosocial intervention. The "word on the corporate street" is that ergonomics programs work (i.e., reduce injuries and save money) and that the most effective way to institute an ergonomics program is through a joint labor/management ergonomics team (as is recommended in all standards). However, none of the requirements for employee participation come close to insuring substantial employee influence on the program.

There is tremendous resistance to the focus on work organization and psychosocial stressors in ergonomic regulations, because their control, much more than the control of physical exposures, may alter **political and power relationships** within companies. For ergonomics programs to be truly successful in reducing rates of disease, it appears that management must distribute or share some power and information. Other forces also require this redistribution within companies: market demands for innovation and creativity, flexible and customized production, and more responsive and effective customer service—all of which are driving organizational change (within certain sectors). It is possible that the confluence of these market forces with new types of and approaches to regulation could result in the gradual reduction of workplace psychosocial stressors and the concomitant improvement in worker health, satisfaction, and well-being.

WORKING LIFE IN JAPAN *by Teruichi Shimomitsu, MD, PhD, and Yuko Odagiri, MD, PhD*

Japan is known among industrial and cardiovascular health circles for having identified and brought to the attention of the world *karoshi*—death from overwork. *Karoshi* is sudden death from ischemic heart disease or cerebrovascular disease due mainly to physiologically demanding work conditions such as long working hours or shift work.[60] *Karoshi* may be thought of as an occupational "sentinel health event" (see Chapter 8) focusing attention on a particular problem of the workplace.

Japan has had difficulty in setting standards for an appropriate number of working hours. Employees, especially middle managers, are often required to work long overtime hours without compensation.[59] Complicating this already difficult situation is the Japanese economic recession of the 1990s, which has forced drastic, systematic reorganization. The unique Japanese employment system, including the lifetime employment system and seniority-constrained wage and promotion systems, is now falling apart. Companies are trying to reorganize by removing layers of management. These reorganizations have brought the workers more work and responsibility, without corresponding increases in pay, as well as a feeling of job insecurity.

According to statistics from the Policy Planning and Research Department of the Ministry of Labor, the percentage of workers who complained of anxiety, worry, and stress in their working lives gradually increased from 50.6% in 1982 to 62.8% in 1997. Another recent report, based on 1998 data, from the Ministry of Health and Welfare says the number of those who died from suicide has dramatically increased to 25.3/100,000 persons from 18.8/100,000 persons in 1997. It is especially high among men in their 50s and has grown by more than 50% among this group in just 1 year. It is speculated that the severe economic situation and physical and mental overload are the main reasons for the high suicide rate.

To protect workers from extreme burdens, the government has taken legislative action and has presented several strategies for dealing with issues of work-related stress and health. In 1972, the **Industrial Safety and Health Law** (ISH Law) was enacted to assure the safety and health of workers in the workplace. The law stipulates that employers must offer an annual physical examination to all workers, which they are required to attend. The goal of the exam is secondary prevention through the early detection and treatment of noncommunicable diseases.

The Ministry of Labor enacted the **Total Health Promotion Plan** in 1988, to deal with the rapid aging of the population and to prevent noncommunicable diseases. It was designed to improve the total health of employees. The goal of this plan is not only early detection and treatment of noncommunicable diseases but also health promotion and disease prevention. Each company has an occupational physician who conducts a medical examination, lifestyle evaluation, and exercise test. An exercise prescription and lifestyle consultation are based on the results. In some cases, mental health care and nutritional guidance also are provided.

A 1992 amendment to the ISH Law included a commitment to facilitate the promotion of a "comfortable" working environment. Here, "comfortable working environment" refers not only to the actual physical workplace but also to the whole working environment.

In 1993, the government established prefectural Industrial Health Promotion Centers and Local Industrial Health Centers in all parts of Japan to support health care, including mental health care, for the employees of smaller firms, which are not able to offer the same healthcare services as larger firms.

With the revision of the ISH Law in 1996, occupational physicians now possess the right to act as direct advisors to employers on working conditions and worker health to prevent occupational illnesses like *karoshi*, and promote health. Conversely, the employers have an obligation to consider the recommendations of the occupational physicians.

In 1998, the Japan Ministry of Labor established the **9th Industrial Accident Prevention Plan**, which includes strategies for managing increasing mental stress: (1) promotion of interdisciplinary research and investigation to prevent stress-related ill health among all workers, especially white-collar workers, (2) maintenance of a high standard of training for managers and supervisors, (3) provision of information to workers to control or manage their own work-related stress, (4) implementation of stress-related consultation systems, and (5) promotion of stress management at the workplace.

Unfortunately, these strategies may not be sufficient to protect workers from ill health. The Tokyo Declaration emphasizes that it is vital to identify ways to overcome current difficulties and prevent foreseeable future difficulties, while at the same time maximizing the tremendous potential inherent in this period of dramatic transformation.[68] It also mentions that there is a great need for the exchange of experiences and increased cooperation between all relevant actors from the world's three leading postindustrial settings, the European Union, Japan, and the U.S., with regard to (1) implementation of information on prevention, (2) surveillance and monitoring, (3) education and training of occupational and other key professional groups, (4) methodological development, and (5) creation of a clearing house for all relevant information using state-of-the-art technology.

We hope policy-makers and decision-makers throughout the three settings utilize the Tokyo Declaration as a framework for healthier work in healthier workplaces.

These demands can be physical, psychological, or both. Stress-related disorders range in intensity from the mild and sub-clinical to the acute and disturbing post-traumatic stress disorders. The implications of stress-related disorders for the WC system are enormous, both in the costs they represent to employers and the toll they take on workers when they go untreated.

Psychiatric injuries (mental-mental claims) due to hostile work environments, sexual harassment, personnel actions, and demands placed on employees (which are perceived as unfair or discriminatory) often result in depression, anxiety, and/or pain disorders. Typically, workers do not file claims for work overload or re-engineering, but rather focus on some negative aspect of their work environment. In CA, for example, psychiatric claims that are substantially (at least 35%) caused by "lawful, nondiscriminatory, good-faith personnel actions" are prohibited. This has shielded many businesses from the effects of downsizing, re-engineering, or what is euphemistically called "creative destruction."

Employees in these "leaner and meaner" organizations face higher demands and longer hours, which may be associated with mild and subclinical signs and symptoms such as anxiety or depression. The law, at least in CA, requires a worker to prove that the actual events of employment were the "predominant cause" (presumed to be more than 50%) among all the other causes of the psychiatric injury. While this has been difficult to prove until recently, more objective analysis of jobs and work environments may hold promise in documenting "actual events."

This more objective approach to assessment is consistent with the Albertson Inc. vs. WCAB 1982 case where a worker's psychiatric stress was based on a misperception of workplace matters. The court ruled that for a psychological injury to be compensable 'tthe employment itself must be a positive factor influencing the course of the disease." In this case the mere perception of psychiatric stress was not sufficient to be considered compensable.

CVD AND WC: LEGAL ASPECTS

The CA Constitution established the WC system to adequately provide "for the comfort, health and safety, and general welfare of any and all workers and those dependent upon them for support to the extent of relieving from the consequences of any injury or death incurred" (Article XIV, Section 4, 1917). This language is broad and flexible in its intent and suggests that as the nature of work changes and our understanding of the consequences of work develops, new medical conditions will be considered compensable.

The labor codes were created to determine whether an injury is work related. The first question is, did the injury "arise out of employment" (AOE), and the second question is did the injury "occur in the course of employment" (COE). There is a requirement to provide a "reasonable link" between exposures and resultant impairments. As part of this linkage "actual events" or tangible exposures and incidents must be present. In certain industrial accidents there is no question that the injury is work related; however, in some cumulative injuries the relationship between workplace risk factors and activities and the resulting disease is equivocal and controversial. There are some well-documented relationships between specific exposures such as vinyl chloride and angiosarcoma of the liver, and there has been a growing consensus about the link between repetitive motion, poor ergonomics, and musculoskeletal disorders. However, medical research has yet to define precisely the causal factors associated with many other occupational illnesses. As noted in the *Physician's Guide to Medical Practice in the California Workers' Compensation*

System, "there are many exposures, pathologies, and diseases that have not been fully investigated, or for which the causal mechanism is not known."

AOE and COE are somewhat overlapping concepts. AOE relates the workplace incident(s), exposures, and risk factors to the damage that a worker has incurred. COE means that the activities are work-related. Therefore, AOE explains what the *nature* of the condition is, and COE pinpoints *where and how* the condition occurred. For example, when an employee goes to the post office to buy stamps for the employer, the task is COE. However, if the employee stops for a personal errand, COE is disrupted.

Note that if a worker has pre-existing CVD that is nondisabling, and the workplace aggravates the condition and causes impairment and disability, the employer is responsible for treatment and/or benefits. The employee (the applicant) must show by the "preponderance of evidence" that the illness or disorder is related to the employment, but it does not have to be the sole source of the injury. The landmark case Liberty Mutual vs. Calabresi (1946) found that the employer was responsible for the resultant disability when a laborer performed heavy lifting with pre-existing CVD. If a workplace accelerates or precipitates symptoms to the point of impairment, the injury is compensable.

When an injury aggravates a pre-existing condition, resulting in permanent disability, **apportionment** (i.e., assignment of causation and responsibility for benefits) becomes an issue. Apportionment does not require an employer to pay for the effects of a pre-existing injury or condition. This is especially relevant in CVD, which may take a number of years to manifest and may have a number of causes. Often, apportionment is difficult because the physician cannot estimate the level of disability that would have existed absent the most recent injury.

In CA and several other states, WC law distinctions are made between illness, impairment, and disability. One may have an illness such as hypertension and not be impaired. Impairment refers to a loss of function. Disability refers to an inability or reduced ability to compete in the open labor market as a result of impairment. Therefore, a disabled worker may have an impairment that interferes with his or her ability to compete in the open labor market, but does not interfere with the current job.

Current Trends in WC for Job Stress

The recent national effort by employers and insurance companies to reduce benefits and tighten eligibility standards for WC claims[67] has led to decreases in benefits paid, minimal changes in insurance premiums, and increases in the overall profitability of WC carriers.[10] It is within this context that many states also have passed laws that establish more stringent criteria for psychiatric stress claims. Due to supposed abuses in psychiatric cases, the CA legislature has established a higher threshold for psychiatric claims for injuries on or after July 16th, 1993. For these claims an injured worker must prove that the actual events of employment were the predominant cause of the psychiatric injury (more than 50%). From January 1990 till July 16th, 1993 there was a 10% threshold for compensability. For psychiatric injuries that result from a violent act, the actual events of employment must have been a substantial cause (35% of the causation from all other sources combined) (LC 3208.3) of the injury.

The revised CA labor codes also prohibit claims for psychiatric injuries that are caused by "lawful, nondiscriminatory, good faith personnel actions." (Similar changes to the law occurred in New York State.) Apparently there were complaints that many employees filed WC claims after receiving poor performance evaluations;

they claimed that they had been harassed. The difference between a good-faith personnel action and an abusive management practice may depend on whose point of view you take, the employee or the manager.

The revised CA psychiatric labor codes have saved employers large sums of money; however, there are significant costs to workers and society in general when mental or physical illness due to job stress is not recognized and treated (see Chapter 11). If one adds the cost of medical care, lost time from work, and morbidity and mortality from new systems of work organization that pressure employees to increase productivity, then productivity gains may not be as impressive as we are led to believe (if they remain at all).[30] By reducing WC benefits and thereby externalizing the costs onto individuals, their families, and health insurance plans, only an illusion of cost reduction and efficiency is created.

Occupational Stress, CVD, and Workers' Compensation

These medical/legal distinctions and definitions are particularly problematic when applied to occupational stress. First, job stress-related disorders may not become manifest for many years. As Selye noted, an individual may be able to resist a stressor for a long period of time before he/she becomes exhausted.[56] Since workers change jobs and employers more frequently than in the past, it is more difficult to attribute a chronic stress condition to a current employer. Apportionment again applies in these cases. However, there is another principle that the employer "takes the employee as he finds him," which means that compensation will not be denied "even though the worker was 'predisposed' to injury or a previous condition made it more difficult for the worker to heal from the injury." Second, many stressors may cause some physical strain without an individual necessarily being aware of it. This is sometimes the case in hypertension (which is generally an asymptomatic condition). Third, stress often has been conceived as a mediated process whereby the individual's coping repertoire either predisposes him to or shields him from health risks. This has led many practitioners to focus on individual factors of resilience or vulnerability (mediators) rather than work-related stressors (primary causes). An extreme form of this approach is illustrated in Millon's analogy of personality as a kind of immune system that buffers individuals from psychological disorders.[36] This personal characteristics hypothesis holds that persistent, adverse psychological reactions after exposure to stressors represent exacerbations of pre-existing character pathology or indicate predisposition to such reactions.

CVD is a multifactorial medical condition. However, for the most part, physician evaluators have tended to focus on nonindustrial causes such as obesity, family history, smoking, and lack of exercise. While these factors undoubtedly contribute to CVD, the basic principle in WC law that the employer "takes the employee as he finds him" applies here also. This principle implies that the employer is responsible for a work-related impairment even if the employee has unhealthy habits, unless and except to the extent the nonindustrial factors caused actual pre-existing disability or would in the absence of industrial injury. Thus, if a work-related psychosocial factor is accepted as a risk factor for hypertension or CVD, even if other risk factors (e.g., obesity) are present, the employer is held responsible for any impairment resulting from exposure to that risk factor.

HIGH-RISK OCCUPATIONS

Work stress has been recognized as a cause of CVD in WC labor codes for many years. Police officers, fire fighters, and other law enforcement groups who

have developed heart diseases have been presumed to have compensable occupational illnesses under CA WC laws. Although there is an intuitive logic that those faced with violence and unpredictable social conflicts experience a kind of stress not found in other occupations, these assumptions are not well documented, nor necessarily even well founded in empirical research. Why are fire fighting and law enforcement presumed compensable for CVD while other types of work are not? When these groups were first made eligible for WC for CV events there was little epidemiologic evidence that they were at high risk. Possible reasons are public sympathy for individuals in these occupations and the political strength of police and fire unions. Today, there is a growing body or research that suggests that there may be other occupational groups who are at equal risk for developing CVD. Acknowledgment of this information would enable workers in other occupations to be recognized as having legitimate WC claims.

Job Strain, Hypertension, and CVD

Within the past two decades a number of workplace psychosocial stressors have been identified. One such exposure is job strain, the consequence of physical and psychological demands placed on workers who do not have adequate control over their tasks. Additional work-related stressors include effort-reward imbalance, shift work, and work overload. Job strain has been found to be associated with a variety of health risks, including CVD,[21,55] and job stress in general has been associated with musculoskeletal disorders.[4,7]

The growing body of epidemiological research that shows an association between job strain, high blood pressure, and CVD is rarely discussed in WC cases. Physicians evaluating employees for WC cases generally are unaware of the job strain data and rarely conduct an analysis of the workplace or job to ascertain levels of exposure to job strain. Most often they rely on the worker's self-report regarding tasks and activities, or on a job description, which is vague and imprecise. Rarely, physicians compare blood pressure readings over time to see if they correlate with the individual's self-reported experience of stress. They also may draw conclusions about work-related stress by measuring blood pressure after a person has been off work or on vacation to check for decreased pressure. Unfortunately, one of the insidious aspects of hypertension is that individuals with this condition are unaware of it and do not experience stress. In some research on job strain, individuals who report having jobs high in demand and low in control fail to report any subjective distress associated with work.

For the most part, physicians tend to overlook the industrial contribution to a patient's illnesses unless the patient complains of stress at work. Frequently, both the illness (hypertension) and the cause (job strain) do not produce obvious symptoms. The physician, unaware that a particular patient has an "at risk" occupation, tends to attribute medical problems to lifestyle or idiosyncratic causes.

The consequence of having a high-strain job is that the worker is subjected to what can best be described as **microtrauma** on a daily basis. This microtrauma may be imperceptible to the worker, who may feel pressure to perform or meet deadlines, but is not subjectively experiencing high levels of distress. In addition, there is evidence that a lack of perceived supervisory support in those facing job strain can exacerbate illness risk.

If one considers these high-job-strain environments to be subjecting workers to microtrauma, then many workers have potentially compensable WC claims. In WC law the term "actual events" refers to whether something tangible and identifiable occurred

in the work environment. Typically, "actual events" refers to exposures to chemicals or, in psychiatric claims, to discrete incidents. Were society to recognize that workplace stressors, such as job strain, caused repeated microtraumas that over time lead to impairment and disability, then many CVD cases would be compensable. (The methodology for assessing actual events [microtrauma] is described in Chapter 2.)

COLLECTIVE BARGAINING TO REDUCE CVD RISK FACTORS IN THE WORK ENVIRONMENT *by Paul Landsbergis, PhD*

Most collective bargaining agreements include limits on exposure to CVD risk factors such as chemical and physical hazards, shiftwork and long work hours, and psychosocial stressors. Contracts can help to moderate job demands, increase employee job control and job skills, and provide a more supportive atmosphere, through provisions on job security, work standards, work assignments, performance evaluations, technological change, harassment, discrimination, staffing, comparable worth, skills training, and career development.[2,57,61] By providing employees with a voice in improving working conditions and protection from arbitrary decisions through seniority provisions, a grievance procedure, or labor-management committees, collective bargaining agreements can help reduce job stress.[29] In addition, by raising income and offering promotion opportunities, such contracts can increase the socioeconomic status (SES) of employees and thereby reduce the risk of CVD associated with low SES. Examples of contract language for two sectors are provided below, followed by language designed to limit exposure to specific job hazards.

Sectors

Clerical and Computer Work. An agreement between Yale University and Local 34, the clerical employees union, provides for greater employee decision-making authority, resources, and support: a labor-management health and safety committee; rules for schedule changes and flex-time; forums for employee participation; day care; leaves of absence; and an employee assistance program.[76] Elsewhere, computer operators have bargained for workstation improvements, ergonomic training, and rest breaks.[42] For example, the American Federation of Teachers (AFT) Local 1521 and the Los Angeles Community College District agreed that "every employee actively working at a video display terminal shall be required to take a 15-minute work break every hour away from the terminal to accomplish other work."[27] There is evidence that greater job decision latitude (control over schedule, regular breaks, and work variety) may help prevent repetitive strain injuries.[37]

Health Care. Nurses' desire for professionalism at work can be thwarted through understaffing (leading to increased workload demands), lack of autonomy, or an authoritarian climate.[49] Collective bargaining can be an important means of achieving professionalism. Unions have bargained for clinical career ladders for nurses in various specialties, joint physician-nurse committees, and greater in-service education.[28] The California Nurses Association recently negotiated a contract with Kaiser Permanente to create 18 new "quality liaison" positions—union-appointed nurses who will monitor conditions, such as understaffing, that affect the quality of patient care as well as increase employee stress.[18] The Service Employees International Union has negotiated contract language on minimum

staffing guidelines, patient care classification, staffing and patient care committees, limits on non-nursing duties, and distribution of workload. Nurses' unions and associations also have negotiated the process and timing of hospital restructuring, have sometimes refused to delegate nursing work to inadequately trained aides, and have protested nurse layoffs through public demonstrations and legislative testimony.[1,8,17,50,75]

Hazards

Chemical, Physical, and Safety Hazards

Many contracts contain provisions to control chemical, physical, and safety hazards. For example, the contract of the Pacific Coast Marine Firemen and the PAC Maritime Association states that "employers agree not to use carbon tetrachloride or other toxic compounds or chemicals that are considered harmful and hazardous to personal health. Refusal to use harmful compounds will not be deemed refusal of duty."[27]

The United Auto Workers (UAW) Local 2244 and the New United Motor Manufacturing, Inc. agreed that "the company will continue to administer a Noise Control and Hearing Conservation Program. . . . A noise abatement plan will be developed on an annual basis and reviewed with the local Union . . . The company will make its best efforts to achieve an 80 dB standard. . . ."[27]

AFT Local 1521 and the Los Angeles Community College District agreed that "during hours of darkness, or when an employee's workstation is in a remote area, Clerical/Technical unit employees may request that campus police provide a security escort for them."[27]

Oil, Chemical, and Atomic Workers Union (OCAW) Local 8-149 and Berlex Laboratories agreed that it is company policy "to provide safe and sanitary working conditions including . . . necessary safeguards on all machinery and equipment in conformity with all Federal, State and Local Regulations . . ." The International Longshoremen's and Warehouse Union and the Pacific Maritime Association agreed that "longshoremen shall not be required to work when in good faith they believe that to do so is to immediately endanger health and safety."[27]

Shiftwork

European unions have negotiated various provisions for reducing the stress of shiftwork, including fewer work hours and early retirement.[15] The civil air traffic agency in Italy and union representatives drew up several agreements between 1982 and 1991 to improve working conditions.[12] Modifications include:

- Modernizing radio systems and automating aeronautical information, flight data processing, and air traffic management. These advances make information more reliable, allow more time for making decisions, eliminate many risky traffic peaks, and provide a more balanced workload.
- Reducing work hours. The operative work week is now 28–30 hours.
- Changing shift schedules: rapid shift rotation (one day on each shift); one night shift followed by 2 days rest; length of shift adjusted to workload (5–6 hours for morning, 7 hours for afternoon, 11–12 hours for night); provision for short naps on the night shift; keeping a regular shift rotation for personal, family, and social life; having a long break (45–60 min.) for a meal during work shifts.
- Reducing environmental stressors, such as decreasing noise and increasing light.
- Improving physical fitness by providing gyms in the largest facilities.

PSYCHOSOCIAL STRESSORS

Effects on Work and Family. The OCAW Local 8-149 Work and Family Program established committees whose members negotiated with management to improve employer policies that have a stressful effect on union members' personal lives and family responsibilities, e.g., mandatory overtime, no advance notice of overtime, access to a telephone during worktime, and lack of parental leave.[35] The Communications Workers of America (CWA) negotiated a policy in their contract with Bell Atlantic that allows workers to return to work on a reduced schedule for up to 12 months after the birth or the adoption of a child. When on reduced schedule, the employee returns to the same status and benefits as before the leave.[24] Paid maternity leave is guaranteed in many European countries.

New Technology and Performance Monitoring. Some contracts have language that require bargaining over the introduction of new technology.[57,61] Job redesign can also be a joint labor-management process. For example, CWA members at an Arizona facility, together with AT&T management, "eliminated individual measurement and remote secret observation." Average work time was measured only for the whole group. "Service observation was performed by small groups of peers by the old-fashioned 'jack-in' method, where the observer sits beside the person being monitored, listens to a few calls and then discusses the results with the employee." As a result, there were fewer customer complaints, and both the grievance rate and absenteeism were lower.[43] A 1989 contract provision between the CWA and U.S. West, which is still in effect, bans individual electronic performance monitoring.

Stress and Speed-Up. The standard office building agreement of the Southern CA Service Employees International Union stipulates "There shall be no speed-up or increase in the work load so as to impose an undue burden upon any employee . . . . or where the effect of such speed up or increase in the work load is to diminish the work force or lessen the total number of hours worked at any location."[57]

Acutely Stressful Traumatic Events. An agreement between AFSCME Local 3999 and the City of Santa Fe calls for "appropriate and adequate Critical Incident Stress Debriefing."[27]

New Systems of Work Organization, including Lean Production. Unions also have negotiated terms for new systems of work organization, which have been introduced by employers throughout the industrialized world to improve productivity, product quality, and profitability. Such new systems have taken a variety of forms and names, including lean production, total quality management, team concept, cellular or modular manufacturing, re-engineering, and patient-focused care. Responses to stressful lean production systems have included strikes, OSHA inspections, surveys to document conditions, and collective bargaining. Such efforts have modified lean production, to some extent, by moderating work demands (via more staff; control over line speed and job standards), increasing job control (e.g., by allowing election of team leaders, transfer between jobs, formation of joint committees), creating ergonomics programs, and expanding access to training.[30]

For example, a 1994 strike by General Motors (GM) workers in Flint, Michigan occurred, according to the UAW, due to increased workload caused by lean production methods, increased overtime, and decreased break time and vacation time—particularly difficult for a work force averaging 47 years of age. They argued that the result was increased stress, sick leave, and repetitive motion injuries. The settlement included: 779 new hires; many workload grievances settled; union approval over

workshops on new manufacturing techniques; a rehabilitation center for injured workers; and an ergonomics agreement.[26,69]

Worker Participation Programs

In some cases, joint labor-management negotiation and implementation of team programs[20] appear to have resulted in improved working conditions. Such programs, sometimes called **High-Performance Work Organizations**, have been established to both increase business competitiveness and "sustain good jobs" within the protection of a union contract.[70] For example, the International Association of Machinists and Maine Iron Works approved a contract giving workers a voice in running the company. This contract bases pay raises on workers learning new skills and contains a no-layoff clause, but also eliminates many work rules.[6]

The GM-UAW creation of the Saturn Auto Company was based on a concept of extensive worker participation and increased worker decision latitude. Workers can decide how to divide up work and rotate tasks within their team, hire new team members, and schedule vacations and other time off.[5] Recently, however, there has been conflict over the scope of teams' latitude and over shiftwork,[25] and in 1999 a new local union leadership was elected pledging to end rotating shifts.[64]

Some agreements (e.g., the United Food and Commercial Workers and Iowa Beef Processors) provide for trained **ergonomic monitors**, employees who conduct workplace surveys and inspections and recommend solutions.[27] Expanding the role of such monitors to include psychosocial work stressors may be a useful component of a workplace surveillance program to detect and reduce CVD risk factors.

The collective bargaining approach is one of the primary strategies used by working people to improve their work environment. It has the advantage of mandating work reforms through a legal document, not easily subject to change due to one manager's whim or management turnover. According to a report from the U.S. Departments of Labor and Commerce, employee participation efforts "in unionized settings in which the union is involved as a joint partner with management are particularly likely to survive."[71] "Over 80% of American workers want a say in decisions affecting their jobs and how their work is performed . . . Outside of union settings, employees have little independent means for initiating these efforts."[71] The ability of employees to apply this strategy is dependent on the proportion of the workforce that belongs to unions (currently only about 15% in the U.S.), the strength of the labor movement in a particular country, and the willingness of unions and management to negotiate over work organization. Collectively bargained efforts also need to be much more extensively evaluated for impact on CVD risk.

REFERENCES

1. American Nurses Association: The Report of Survey Results: The 1994 ANA Layoffs Survey. Washington DC, ANA, 1995.
2. Arndt R: Coping with job stress: The role of the union safety and health committee. Labor Studies J 6:53–61, 1981.
3. Bernard B: Musculoskeletal Disorders and Workplace Factors. Pub. No. 97-141. Washington DC, U.S. Department of Health and Human Services, National Institute for Occpational Safety and Health, 1997.
4. Bernard B, Sauter S, Fine L, et al: Job task and psychosocial risk factors for work-related musculoskeletal disorders among newspaper employees. Scand J Work Environ Health 20:417–426, 1994.
5. Bluestone B, Bluestone I: Workers (and managers) of the world unite. Technology Review 30–40, 1992.
6. BNA Current Developments. August 23, 1994, p A3.
7. Bongers PM, de Winter CR, Kompier MAJ, Hildebrandt VH: Psychosocial factors at work and musculoskeletal disease. Scand J Environ Health 19:297–312, 1993.
8. Brannon RL: Restructuring hospital nursing: Reversing the trend toward a professional workplace. Int J Health Serv 26:643–654, 1996.
9. Brulin G, Nilsson T: Arbetsutveckling och forbattrad produktivitet (Work development and improved productivity). Stockholm, School of Business Research, 1995.

10. Burton J: Workers' Compensation Monitor 10 (July-August), 1997.
11. California Code of Regulations: Title 8, Section 5110. Repetitive Motion Injuries. 1997.
12. Costa G: A seven-point programme to reduce stress in air traffic controllers in Italy. Conditions of Work Digest: Preventing Stress at Work, Vol. 11. Geneva, International Labor Office, 1992, pp 172–183.
13. EHN: Social Factors, Work, Stress, and Cardiovascular Disease Prevention in the European Union. Brussels, European Heart Network, 1998.
14. EU: Report on Work-Related Stress. The Advisory Committee for Safety, Hygiene, and Health Protection at Work. Luxembourg, European Commission, 1997.
15. European Foundation for the Improvement of Living and Working Conditions: Compensation for shiftwork. Bulletin of European Shiftwork Topics. No. 4. 1991.
16. Gersuny C: Work hazards and industrial conflict. Hanover, New Hampshire, University of New England, 1981.
17. Grenier A: Cost and quality matters: Workplace innovations in the health care industry. Washington DC, Economic Policy Institute, 1995.
18. Gruelle M: California nurses win battle at Kaiser over health care. Labor Notes, May 1998.
19. Johnson JV, Hall EM: Job strain, workplace social support, and cardiovascular disease: A cross-sectional study of a random sample of the Swedish working population. Am J Public Health 78:1336–1342, 1988.
20. Kaminski M: Wayne integrated stamping and assembly plant, Ford Motor Co./UAW local 900. In Kaminski M, Bertell D, Moye M, Yudken J (eds): Making Change Happen: Six Cases of Unions and Companies Transforming Their Workplaces. Washington DC, Work and Technology Institute, 1996, pp 25–44.
21. Karasek R, Theorell T: Healthy Work: Stress, Productivity, and the Reconstruction of Working Life. New York, Basic Books, 1990.
22. Kogi K: International regulations on the organization of shift work. Scand J Work Environ Health 24 Suppl 3:7–12, 1998.
23. Kourinka I, Forcier L: Work-Related Musculoskeletal Disorders: A Reference Book for Prevention. London, Taylor & Francis, 1995.
24. Labor News for Working Families. Vol. 6, issue 4, Fall 1998.
25. Labor Notes. January 3, 1995.
26. Labor Notes. November 1994.
27. Labor Occupational Health Program: Collective Bargaining for Health and Safety: A Guidebook for Unions. Berkeley, LOHP, University of California, 1999.
28. Landsbergis PA: Occupational stress among nurses: New developments in theory and prevention. In Humphrey (ed): Human Stress: Current Selected Research, Vol. 3. New York, AMC Press, 1989, pp 173–195.
29. Landsbergis PA, Cahill J: Labor union programs to reduce or prevent occupational stress in the United States. Int J Health Serv 24:105–129, 1994.
30. Landsbergis PA, Cahill J, Schnall P: The impact of lean production and related new systems of work organization on worker health. J Occup Health Psychol 4:108–130, 1999.
31. Leino PI, Hanninen V: Psychosocial factors at work in relation to back and limb disorders. Scand J Work Environ Health 21:134–142, 1995.
32. Levi L: Stress management and prevention on a European Community level: Options and Obstacles. In Kenny D (ed): Stress and Health—Research and Clinical Applications. North Ryde, Australia, Fine Arts Press, 1999, pp 279–294.
33. Loghman-Adham M: Renal effects of environmental and occupational lead exposure. Environ Health Perspect 105:928–939, 1997.
34. Lowry LK: The biological index: Its use in assessing chemical exposures in the workplace. Toxicology 47:55–69, 1987.
35. May L: Work and family committees. Conditions of Work Digest: Preventing Stress at Work, Vol. 11. Geneva, International Labor Office, 1992, pp 164–171.
36. Millon T: Disorders of Personality. New York City, Wiley Press, 1981.
37. Moon SD, Sauter SL: Beyond Biomechanics: Psychosocial Aspects of Musculoskeletal Disorders in Office Work. London, Taylor & Francis, 1996.
38. National Safety Council: ASC Z-365 Draft Ergonomic Standard, Section 6, 1998.
39. National Safety Council: ASC Z-365 Draft Ergonomic Standard, Sections 1–4, 1997.
40. NIOSH: NIOSH Pocket Guide to Clinical Hazards. Pub. No. 94–116. Cincinnati, OH, U.S. Department of Health and Human Services, National Institute for Occupational Safety and Health, 1994.
41. North Carolina Department of Labor: Draft Section. 0600. Ergonomic Standard, http:www.dol.state.nc.us/news/ergostd.htm, 1999.
42. NYC unions win safety pact. VDT News 7:5, 1990.
43. Office of Technology Assessment: The Electronic Supervisor: New Technology, New Tensions. OTA-CIT-333. Washington DC, U.S. Government Printing Office, 1987.
44. Omae K, Takebayashi T, Nomiyama T, et al: Cross-sectional observation of the effects of carbon disulphide on arteriosclerosis in rayon manufacturing workers. Occup Environ Med 55, 1998.
45. OSHA: Draft Ergonomics Program Standard. Occupational Safety and Health Reporter, Vol. 28. Washington DC, Bureau of National Affairs, 1999.
46. OSHA: Draft Proposed Ergonomic Protection Standard. Special Supplement of the Occupational Safety and Health Reporter, Vol. 24. Washington DC, Bureau of National Affairs, 1995.
47. Paoli P: Second European Survey on Working Conditions 1996. Dublin, European Foundation for the Improvement of Living and Working Conditions, 1997.
48. Paoli P: First European Survey on the Working Environment 1991–1992. Dublin, European Foundation for the Improvement of Living and Working Conditions, 1992.
49. Ponack AM: Unionized professionals and the scope of bargaining: A study of nurses. Ind Labor Rel Rev 34:396–407, 1981.

50. Richardson T: Reengineering the hospital: Patient-focused care. In Parker M, Slaughter J (eds): Working Smart. Detroit, Labor Education and Research Project, 1994, pp 113–120.
51. Rosa R, Colligan M: Plain Language about Shift Work. Cincinnati, DHSS/NIOSH Pub. No. 97-145, 1997.
52. Russo R, Attorney at law, Former president of the California Applicant Attorney's Association. Personal Communication, 1999.
53. Saksvik PO, Nytro K: Implementation of internal control of health, environment, and safety in Norwegian enterprises. Safety Science 23:53–61, 1996.
54. Sauter SL, Hurrell JJ Jr, Murphy LR, Levi L: Psychosocial and Organizational Factors. Introduction, Chapter 34.2. Encyclopaedia of Occupational Health and Safety. Geneva, International Labour Office, 1998.
55. Schnall PL, Landsbergis PA, Baker D: Job strain and cardiovascular disease. Annu Rev Public Health 15:381–411, 1994.
56. Selye H: The general adaptation syndrome and the diseases of adaptation. J Clin Endocrinol 6:117, 1946.
57. Service Employees International Union: Stress: Contract Provisions. Washington DC, SEIU, 1983.
58. Service Employees International Union: Nurse Staffing Kit. Washington DC, SEIU, 1998.
59. Shimomitsu T: Occupational health and stress in Japan. Asian-Pacific Newsletter on Occupational Health and Safety 6:16–19, 1999.
60. Shimomitsu T, Levi L: Recent working life changes in Japan. Eur J Public Health 2:76–86, 1992.
61. Shostak AB: Union efforts to relieve blue-collar stress. In Cooper CL, Smith MJ (eds): Job Stress and Blue-Collar Work. New York, Wiley, 1985, pp 195–205.
62. Siegrist J: Adverse health effects of high-effort/low-reward conditions. J Occup Health Psychol 1:27–41, 1996.
63. Sinclair U: The Jungle. Bantam Classics, 1981.
64. Slaughter J: 'Partnership' takes a hit at Saturn. Labor Notes, April 1999.
65. State of California Department of Industrial Relations: Physician's Guide to Medical Practice in the California Workers' Compensation System, 2nd ed. Sacramento, California DIR, 1997.
66. State of Washington Department of Labor: Fitting the Job to the Worker: An ergonomics program guideline. http://www.ergoweb.com/Pub/Info/Std/fjw.html, 1995.
67. Tarpinian G, Tuminaro D, Shufro J: The politics of workers' compensation in New York State. New Solutions, Summer:35–45, 1997.
68. The Tokyo Declaration. J Tokyo Med Univ 56:760–767, 1998.
69. Time: October 24, 1994.
70. Turner BJ: Getting to high performance workplaces. In Kaminski M, Bertell D, Moye M, Yudken J (eds): Making Change Happen: Six Cases of Unions and Companies Transforming Their Workplaces. Washington DC, Work and Technology Institute, 1996, pp 1–2.
71. U.S. Departments of Labor and Commerce: Fact Finding Report. Commission on the Future of Worker-Management Relations. Washington DC, U.S. Departments of Labor and Commerce, 1994.
72. Warren N: The Organizational and Psychosocial Bases of Cumulative Trauma and Stress Disorders. UMI Number 9726279. Lowell, University of Massachusetts, 1997.
73. Warren ND, Dillon CD, Morse T, et al: Biomechanical, psychosocial, and organizational risk factors for WRMSD: Population-based estimates from the Connecticut Upper-Extremity Surveillance Project. (Revised and resubmitted to J Occup Health Psych, 2/99), 1999.
74. WHO: Health Promotion in the Workplace. Strategy Options. European Occupational Health Series No. 10. Copenhagen, World Health Organization Regional Office for Europe, 1995.
75. Wunderlich GS, Sloan FA, Davis CK: Nursing staff in hospitals and nursing homes: Is it adequate? Washington DC, National Academy Press, 1996.
76. Yale University & Local 34–Federation of University Employees: Agreement. New Haven, CT, 1988.