

**CHS M278/EHS M270: Work and Health**  
**(4 Units)**  
**Winter 2004**

January 13, 2004 – March 16, 2004  
Tuesdays, 12-3pm; CHS 23-105

**Course description:**

The impact of work on physical and psychological health is explored in the context of a newly emerging discipline. The focus is on psychosocial stressors, measurement (including hands-on experience), contextual factors (gender, ethnicity, social class), and how work stressors can be ameliorated.

**Instructor:**

Peter Schnall, Department of Medicine, UCI, and Community Health Sciences, UCLA School of Public Health

**Assistant:**

Kanan Patel-Coleman, Environmental Health Sciences, UCLA School of Public Health

**Course requirements:**

It is recommended (not required) that students have completed a graduate level statistics/methods course and a course in epidemiology. The class will have 10 three-hour sessions and will meet weekly.

The course, while primarily didactic, will include hands on use of psychosocial questionnaires as part of course assignments (30%), midterm (30% of grade), and final exam (30%). Class participation, reflecting an understanding of the course readings, will make up the remaining 10% of the grade. The take-home final exam will cover lecture materials, readings and experiences derived from use of the questionnaires. Final exam questions will be distributed at the last class session.

**Required readings:**

Schnall PL, Belkic K, Landsbergis PA, Baker D. (eds.) The Workplace and Cardiovascular Disease. Occupational Medicine: State of the Art Reviews. 2000; 15(1). Available in class.

Course reader. Available at Course Reader Material, 1141 Westwood Blvd., Westwood (310) 443-3303.

**Overview of sessions:**

<b>Week</b>	<b>Description</b>
1	Introduction to psychosocial factors in the workplace
2	Conceptual and theoretical models: Operationalization, measurement, and assessment of psychosocial factors
3	The Occupational Stress Index: an approach informed by insights from cognitive ergonomics and brain research
4	Physiological mechanisms leading to adverse physical and mental health outcomes
5	Assessing health outcomes with a focus on ambulatory blood pressure measurements
6	Contextual factors mediating outcomes
7	International and cross-cultural comparisons; economics costs of stressful working conditions
8	Primary intervention: work organization redesign
9	Secondary intervention: individual programs
10	Programs and policies for regulation of workplace stressors; course wrap-up and conclusions

## Description of sessions

### I. Introduction to psychosocial factors in the workplace.

Working people develop a wide variety of illnesses during their working lives, manifested in time lost from work, disability, physical incapacity, psychological distress and ultimately morbidity and mortality. How/whether these manifestations are connected to work is a critically important issue for those in the fields of medicine, occupational and public health. We will introduce the social epidemiologic approach, in which the workplace is viewed as a key determinant of a wide variety of behavioral and health outcomes. In other words, we focus upon the workplace as a relatively distal cause of these outcomes and view personality and individual factors as more proximal. Through viewing of a segment of Charlie Chaplin in the film *Modern Times*, we present two approaches to OHP, one of which focuses on individual coping and the other on the impact of the workplace on the individual. We present a brief overview of the field of stress research, and then examine in depth the historical origins of theoretical models of workplace psychosocial stressors.

Practicum Packet (to be handed out in class) that includes Job Content Questionnaire (JCQ), Effort-Reward Imbalance (ERI) and Occupational Stress Index (OSI) surveys.

#### Readings:

Schnall PL, Belkic K, Landsbergis PA, Baker D.A. Why the workplace and cardiovascular disease? In: Schnall PL, Belkic K, Landsbergis PA, Baker D. (eds.) The Workplace and Cardiovascular Disease. Occupational Medicine: State of the Art Reviews. 2000; 15: 1-5.

Stressors at the Workplace: Theoretical Models. In: Schnall PL, Belkic K, Landsbergis PA, Baker D (eds.) Occupational Medicine: State of the Art Review. The Workplace and Cardiovascular Disease. 2000; 15 (1): 69-105.

Health, Productivity and Work Life in Karasek RA, Theorell T. Healthy Work: Stress, productivity and the reconstruction of working life. New York. Basic Books, Inc., 1990. Pg 1-31.

### II. Conceptual and theoretical models: Operationalization, measurement, and assessment of psychosocial factors.

Several theoretical models of workplace psychosocial stressors have been empirically validated, including the Demand-Control-Support, or job strain, model and the Effort-Reward Imbalance (ERI) model. Karasek's job strain model states that the greatest risk to physical and mental health from stress occurs to workers facing high psychological workload demands or pressures combined with low control or decision latitude in meeting those demands and low social support from others. Johannes Siegrist's broader ERI model defines stressful job conditions as a "mismatch between high workload (high demand) and low control over long-term rewards". In comparison to the DCS model with its emphasis on moment-to-moment control over the work process (i.e., decision latitude), the ERI model provides an expanded concept, emphasizing macro-level, long-term control vis-à-vis rewards such as career opportunities, job security, esteem and income. The ERI model also integrates the exigencies and rewards of the job with the individual's input and coping style.

This session describes three main approaches for measurement of job characteristics: self-report questionnaires (e.g., Job Content Questionnaire to measure job strain, ERI questionnaire, Occupational Stress Index); imputation of job characteristics scores based on aggregate data (e.g. national job title averages); and external assessment (e.g. supervisor or coworker ratings, job analysis by expert observers). We review important research results, highlight advantages and limitations of each method and discuss some issues to be resolved through future research. We recommend multi-method strategies for convergent validation, using as many of these approaches as

possible.

Practicum: Review JCQ and ERI surveys in detail

Readings:

Measurement of psychosocial workplace exposure variables. In: Schnall PL, Belkic K, Landsbergis PA, Baker D (eds.) Occupational Medicine: State of the Art Review. The Workplace and Cardiovascular Disease. 2000; 15(1): 163-188.

Johnson JV, Hall EM. Class, work, and health. In: Amick B, Levine S, Tarlov AR, Walsh DC (eds.): Society and Health. New York, Oxford University Press, 1995, pp. 247-271.

Karasek RA, Theorell T. The psychosocial work environment. In: Healthy Work: Stress, productivity and the reconstruction of working life. New York. Basic Books, Inc., 1990, pp.31-82.

Stressors at the Workplace: Theoretical Models. In: Schnall PL, Belkic K, Landsbergis PA, Baker D (eds.) Occupational Medicine: State of the Art Review. The Workplace and Cardiovascular Disease. 2000; 15 (1): 73-87.

### **III. The Occupational Stress Index: An approach informed by insights from cognitive ergonomics and brain research.**

Complementary to constructs such as the Job Strain model and ERI, that are based heavily upon sociological theory, are approaches derived from cognitive ergonomics and brain research. These help describe, in more quantitative terms, the burden of work processes upon the central nervous system (CNS). Thus, e.g., when speaking of psychologically demanding work, we can go far beyond queries about “working hard” and “working fast,” to analyze tasks in terms of allocation of mental resources. In the Occupational Stress Index (OSI), an additive burden model, we have sought to delineate work stressors in terms of how the CNS receives and processes information. Thus, we consider objective factors such as the nature and temporal density of incoming signals, the complexity and speed with which these are processed, inter alia, as well as how much control the worker has in modulating these, and other, demanding factors. From the vantage point of cognitive ergonomics, there is an inextricable coupling between the demand and the control dimensions: with sufficient decision-latitude, or control, a worker can modulate even a fairly onerous, though not overwhelming, psychological workload to meet his or her moment-to-moment needs and capacities. This approach helps us to better define, and thereby hopefully to protect the worker against exposure to overwhelming psychological demands. Cognitive ergonomics and brain research also point us to another dimension of stressful work: “disaster potential” or “symbolic aversiveness”, a new dimension incorporated into the OSI. For survival reasons, our nervous systems are constructed to selectively allocate mental resources to threatening stimuli, even if the threat is only of a symbolic nature. The heaviest burden upon conscious attentional resources occurs when one continuously follows a barrage of signals to which he or she must be prepared to rapidly respond, such that momentary lapse, error or delay could have serious, or even fatal consequences; this is Threat Avoidant Vigilance. We provide practical information and instruction on how to utilize psychosocial stress questionnaires, including the JCQ, ERI and the OSI.

Practicum: review OSI survey in detail

Readings:

Belkic K. Occupation-Specific versus General Self-Report Measures to Assess Psychosocial Workplace Exposures: Dilemmas and Potential Solutions to Bridge the Gap. Workshop on Psychosocial Work Environment Assessment Issues Conference on Occupational Assessment--June 12, 2001, Gothenburg, Sweden.

Cardiovascular evaluation of the work and workplace: A practical guide for clinicians. In: Schnall PL, Belkic K, Landsbergis PA, Baker D (eds.) Occupational Medicine: State of the Art Review. The Workplace and

Cardiovascular Disease. 2000; 15 (1): 213-222.

Stressors at the Workplace: Theoretical Models. In: Schnall PL, Belkic K, Landsbergis PA, Baker D (eds.) Occupational Medicine: State of the Art Review. The Workplace and Cardiovascular Disease. 2000; 15 (1):87-98.

#### **IV. Physiological mechanisms leading to adverse physical and mental health outcomes.**

This session will draw from extensive research which reveals that a wide range of workplace conditions have been implicated as risk factors for a variety of health problems including cardiovascular disease (CVD), psychological distress and work-related musculoskeletal disorders. These workplace conditions include shift work, long work hours, and chemical, physical, and psychosocial conditions. The most consistent evidence is provided by sources of psychosocial stress at work. The deleterious physiological effects of different stressful work scenarios are reviewed, with a focus on cardiovascular hemodynamic changes leading to the development of essential hypertension. Mechanisms will be discussed by which long work hours and shift work as well as exacerbating physical stressors such as noise, glare, heavy lifting, vibration, cold and heat can impact upon physiologic systems. Occupational groups exposed to a large number of these stressors are found to be at high risk for hypertension, myocardial infarction, stroke, peptic ulcer disease, headache, musculoskeletal disorders, burnout, depression, anxiety and other undesirable outcomes. They may also be susceptible to mood and sleep disturbances and disrupted relationships with family and friends.

Practicum: Students turn in scored packets and work histories

Readings:

The central nervous system: Bridge between the external milieu and the cardiovascular system. In: Schnall PL, Belkic K, Landsbergis PA, Baker D (eds.) Occupational Medicine: State of the Art Review. The Workplace and Cardiovascular Disease. 2000; 15 (1):107-115.

Evidence for mediating eoneurocardiologic mechanisms. In: Schnall PL, Belkic K, Landsbergis PA, Baker D (eds.) Occupational Medicine: State of the Art Review. The Workplace and Cardiovascular Disease. 2000; 15(1): 117-162.

#### **V. Assessing health outcomes with a focus on ambulatory blood pressure.**

Research studies reveal that a wide range of workplace conditions have been implicated as risk factors for a variety of health problems including cardiovascular disease (CVD), psychological distress and work-related musculoskeletal disorders. These workplace conditions include shift work, long work hours, threat avoidant vigilant work and chemical, physical, and psychosocial conditions. We will review the strength of evidence for these outcomes and examine the role of potential confounders in evaluating the research results. We will present an overview of methods to assess health outcomes including medical exams, workplace injury records, and mental health scales evaluating burnout, depression or anxiety. Special emphasis will be given on workplace ambulatory blood pressure monitoring as an efficacious, non-invasive method for identifying work-related hypertension.

#### **Midterm Distributed (return in one week at Session VI)**

Practicum: Feedback on questionnaires and work histories

Readings:

Workplace factors and CVD outcomes. In: Schnall PL, Belkic K, Landsbergis PA, Baker D (eds.) Occupational Medicine: State of the Art Review. The Workplace and Cardiovascular Disease. 2000; 15 (1): 49-57. (Read Brisson section on Women, work, and cardiovascular disease.)

Landsbergis PA, Schnall PL, Dietz DK, Warren K, Pickering TG, Schwartz JE. Job strain and health behaviors:

Results of a prospective study. American Journal of Health Promotion 1998; 12(4):237-245.

## **VI. Contextual factors mediating outcomes**

We will discuss current models of the complex pathways through which social conditions produce stress and influence behavior and risk of disease which progresses from general macro social conditions down to micro level processes in individual persons. These models describe how social structure (e.g., socioeconomic status or social class, race, gender) shapes the immediate social environment (e.g., working conditions, housing, neighborhood, access to services), which influences lifestyle behaviors (e.g., smoking, diet, exercise), personality and psychological characteristics (e.g., hostility, self-efficacy, depression, Type A behavior, individual coping), and physiological risk factors for disease (e.g., blood pressure, cholesterol, overweight). In the context of these models, research findings linking personality/psychological characteristics, social conditions, job conditions and disease states are discussed. In addition, emphasis will be placed on recent research on the job strain model and the influence of job characteristics on behaviors, psychological characteristics and physiological responses to stress. This includes studies on the effects of "passive" (low demand-low control) jobs on reducing self-efficacy and increasing passive behavior, external locus of control, feelings of depression and learned helplessness; and the effects of "active" (high demand-high control) jobs on increasing active learning, internal locus of control, a broader range of coping strategies, and intellectual flexibility.

Practicum: blood pressure measurements using ambulatory monitors

Readings:

Weidner, G, Boughal, T, Connor, SL, Pieper, C, Mendell NR. Relationship of job strain to standard coronary risk factors and psychological characteristics in women and men of the Family Heart Study. Health Psychology 1997; 16:239-247.

Perry-Jenkins, M, Repetti, R, Crouter, AC. Work and family in the 1990's. Journal of Marriage and the Family 2000; 62:981-998.

Karasek RA, Theorell T. The demand/control model and other stress and learning models compared. Healthy Work: Stress, productivity and the reconstruction of working life. New York. Basic Books, Inc., 1990, pp.89-103.

Dooley, D., Prause, J., Ham-Rowbottom, K. A. Underemployment and depression: Longitudinal relationships. Journal of Health and Social Behavior. 2000; 41: 421-436.

Turner JB. Economic context and the health effects of unemployment. Journal of Health and Social Behavior. 1995; 36:213-229.

Landsbergis, PA, Schnall PL, Pickering TG, Warren K, Schwartz JE. Lower socioeconomic status among men in relation to the association between job strain and blood pressure. Scandinavian Journal of Work and Environmental Health. 2003; 29(3):206-215.

## **VII. International and cross-cultural comparisons; Economic costs of workplace psychosocial factors**

The field of psychosocial stressors in the workplace and harmful health consequences is a relatively new area, with most of the research based in post-industrial nations. Some work is currently being done to translate and validate survey tools into other languages, which will then be used to conduct research in industrializing countries or among immigrant groups within the more developed countries. Cross-cultural studies are important to the development of the field to further understand contextual factors that may modify health outcomes. The first half of this session will raise unique questions to consider in comparative research.

In the second half, costs associated with job stress will be discussed. Stressful working conditions are associated

with increased absenteeism, tardiness, and intentions by workers to quit their jobs - all of which have a negative effect on the economic soundness of a work organization. The costs of workers' compensation for work-related disease may also provide an incentive to reduce workplace exposure to psychosocial stressors.

### **Midterm Due**

Practicum: None

Readings:

Moure-Eraso, R., Wilcox, R., Punnett, L., MacDonald, L., Levenstein, C. Back to the future: Sweatshop conditions on the Mexico-US border. II. Occupational health impact of maquiladora industrial activity. *Am. J. Ind. Med.*, 1997, 31:587-599.

### **VIII. Primary intervention: work organization redesign**

Health educators, health psychologists, behavioral specialists and occupational health specialists have become increasingly aware of the workplace as a critical social environment that influences health behaviors. Two primary strategies (primary and secondary interventions, respectively) have been utilized to manage stress at work: organizational change approaches and stress management programs. Organizational change involves the identification of stressful aspects of work (e.g., excessive workload, conflicting expectations) and the design of strategies to reduce or eliminate the identified stressors. In this session primary prevention strategies, aimed at redesigning jobs, work organization and employer policies, will be considered using case studies as examples.

Practicum: Review midterm

Readings:

Workplace factors and CVD outcomes. In: Schnall PL, Belkic K, Landsbergis PA, Baker D (eds.) Occupational Medicine: State of the Art Review. The Workplace and Cardiovascular Disease. 2000; 15 (1): 7-68.

Landsbergis PA, Cahill J, Schnall P. The impact of lean production and related new systems of work organization on worker health. Journal of Occupational Health Psychology. 1999; 4(2):108-130.

### **IX. Secondary intervention: individual programs**

Stress management programs (secondary intervention) teach workers about the nature and sources of stress, the effects of stress on health, and personal skills to reduce stress. We will also discuss programs that are complementary to these efforts, such as individual stress management and health promotion. Examples will be provided of programs that integrate workplace health promotion and occupational health.

Practicum: none

Readings:

Murphy, L. R. (1996). Stress management in work settings: A critical review of health effects. American Journal of Health Promotion, 11, 112-135.

Van Dierendonck, D., Schaufeli, W. B., & Buunk, B. P. (1998). The evaluation of an individual burnout intervention program: The role of inequity and social support. Journal of Applied Psychology, 83, 392-407.

Munz, D. C., Kohler, J. M., & Greenberg, C. I. (2001). Effectiveness of a comprehensive worksite stress management program: Combining organizational and individual interventions. International Journal of Stress Management, 8, 49-62.

## **X. Programs and policies for regulation of workplace stressors; Course wrap-up and conclusions.**

The first half of this session will review the variety of legal and legislative measures that have been instituted to reduce employee exposure to workplace stressors. These include legislation (and accompanying regulations) and collective bargaining by labor unions and employers, both of which are designed to reduce exposure to workplace chemical, physical, ergonomic and psychosocial hazards. The state of legislation (and regulations) in Europe, the United States and Japan is briefly reviewed. In addition, the use of workers' compensation and collective bargaining as prevention strategies in the United States will be discussed.

The second half of this session will allow for a discussion that reviews the major themes of the course. The empirical (epidemiologic), theoretical, and biological evidence presented in this course provides convergent validation that the relationship between workplace stressors and a number of adverse health outcomes is causal. In other words, the empirical findings are consistent with and predicted by the theoretical models, while the linkage between the theoretical models and empirical evidence is demonstrated to be plausible by considering biological mechanisms and experimental research. Based upon these conclusions, new strategies are explored for enhanced prevention and clinical management, work place interventions, and social policy to reduce the impact of disease, psychological distress and unhealthy behaviors that result from stressful working conditions. These strategies acquire an urgent public health dimension, given the magnitude of the epidemic of stress-related diseases and widespread psychological/behavioral effects, and the current deterioration in conditions of working life. Creating a healthy work environment is a high priority, and would entail the full participation of working people in the decision-making processes surrounding the organization of work.

Practicum: review for final

Readings:

Kristensen, TG. Workplace intervention studies. In: Schnall PL, Belkic K, Landsbergis PA, Baker D. (eds.) The Workplace and Cardiovascular Disease. Occupational Medicine: State of the Art Reviews. 2000; 15: 293-305.

Landsbergis PA, Cahill J, Schnall PL. The impact of lean production and related new systems of work organization on worker health. J Occup Health Psychol 1999; 4: 1-23.

The Tokyo Declaration on Work-Related Stress and Health in Three Post-Industrial Settings-EU, Japan and USA. J Tokyo Med Univ 1998; 56: 760-767.

Belkic K, Schnall P, Landsbergis P, Baker D. The workplace and cardiovascular health: Conclusions and thoughts for a future agenda. In: Schnall PL, Belkic K, Landsbergis PA, Baker D (eds.) Occupational Medicine: State of the Art Review. The Workplace and Cardiovascular Disease. 2000; 15 (1): 307-321.

Gardell B. Worker participation and autonomy: a multilevel approach to democracy at the workplace. In: Johnson JV, Johansson G. (Eds.) The Psychosocial Work Environment: Work Organization, Democratization and Health. Essays in Memory of Bertil Gardell. Baywood Publishing Co., Inc., Amityville, 1991, pp. 193-223.