CPH News and Views
A semi-monthly column on emerging topics related to healthy workplaces

Issue #3: How does job stress contribute to cardiovascular disease, and what can be done to intervene?

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Cardiovascular diseases (CVD) are the leading cause of death in the United States. Considerable evidence has demonstrated that occupational stress contributes to CVD morbidity and mortality. It is estimated that up to 23 percent of heart disease related deaths per year could be prevented if the levels of job strain in the most stressful occupations were reduced to average levels seen in other occupations. Clinicians, however, usually do not consider occupational stress as a preventable risk factor for CVD.

Job stress results from the interaction of the worker and the working conditions. Specific workplace features of concern include highly repetitive, monotonous tasks, excessive job demands and time pressure, racial or sexual discrimination; management style, interpersonal relationships, work roles, job insecurity, and environmental exposures such as constant background noise, or heat. One very widely used definition of stressful work is the combination of high demands with little or no leeway for decision-making about the job (also referred to as "high demand/low control" or "job strain"). A high demand with insufficient rewards (known as "effort/reward imbalance") has also been highlighted as problematic.

Evidence supporting the multiple mechanisms by which job stress contributes to cardiovascular diseases (and other chronic health conditions) comes from a vast body of international scientific literature that includes epidemiologic studies, patho-physiological studies of animals and humans, and behavioral studies. Stressful conditions on the job can result in at least three main mechanisms or pathways:

1. **Changes in physiological processes** that increase the risk for CVD—high cholesterol, high blood pressure, high blood sugar, weakened immune response, high cortisol, and changes in appetite and digestive patterns.
2. **Changes in behavior** that increase the risk for CVD—low physical activity levels, excessive coffee consumption, smoking, poor dietary habits.
3. **Development of mental health conditions** (anxiety and depression) that independently increases the risk for a range of chronic health conditions, including CVD (obesity, stroke, atherosclerosis, arrhythmias, myocardial infarction, etc.).

Contemporary worksite interventions to reduce CVD risk often combine individual behavior change with environmental and policy supports to address modifiable risk factors such as smoking, physical activity and nutrition. However, these approaches do not address the underlying sources of workplace stress that contribute to the progression of disease. Fortunately, some intervention studies have shown promising results for improving physiologic indicators for CVD by changing working conditions. Specifically, evidence from intervention research shows clear benefits for a "systems" approach that emphasizes **primary prevention,** and that combines approaches for improving working conditions with approaches for managing occupational stress-related illnesses. Examples of primary prevention approaches include clarifying worker roles, increasing worker decision making opportunities, improving worker-

management communication, ensuring a respectful work environment, and increasing social interaction between workers. Examples of managing occupational stress-related illness include training on stress management techniques, providing space for exercise and medication, and providing access to employee assistance programs (EAP).

In addition to worksite interventions, health professionals also have a role to play for patient education. Health professionals can help patients avoid the harmful effects of stress by screening patients for depression and stress (and making referrals to mental health specialists when appropriate), providing educational materials for managing stress, and counseling heart attack patients about the need to minimize occupational stress exposure (through shortened hours, work week, or modified job tasks, etc.) when they return to work to prevent a recurrent event.

For a literature review on these topics, see: Landsbergis, P. A., et al. (2001) "Work stressors and cardiovascular disease." Work 17(3): 191-208, and LaMontagne A, et al. (2007) "A Systematic Review of the Job-stress Intervention Evaluation Literature, 1990-2005" International Journal of Occupational and Environmental Health 13: 268-280.

Abbreviations used: Cardiovascular disease (CVD), employee assistance programs (EAP)

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Recommended websites on related topics

- Job Stress Network www.workhealth.org/
- NIOSH Stress at Work www.cdc.gov/niosh/stresswk

Recommended journal articles:

Aboa-Eboule, C. (2007) "Job strain and risk of acute recurrent coronary heart disease events." JAMA 298(14): 1652-1660.

Karasek, R.A., Theorell, T. (1990) Healthy work. Stress, productivity and the reconstruction of working life. New York NY: Basic Books.

LaMontagne A, et al. (2007) "Protecting and promoting mental health in the workplace: developing a systems approach to job stress." Health Promotion Journal of Australia 18(3): 221-227.

Landsbergis, P.A., Schurman S.J., et al. (1993) "Job Stress Network." Retrieved October, 2007, online at: www.workhealth.org/prevention/prjscvd.html.

National Institute of Occupational Safety and Health. (1999) Stress at Work. DHHS (NIOSH) Publication Number 99-101. Available online at: http://www.cdc.gov/niosh/stresswk.html.

National Institute of Occupational Safety and Health. (2002) The Changing Organization of Work and the Safety and Health of Working People. DHHS (NIOSH) Publication Number 2002-116. Available online at: http://www.cdc.gov/niosh/02-116pd.html.

CPH-NEW
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We welcome your responses and discussion. Please send all questions and comments to CPHNEW@uml.edu.