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Solutions for Workplace Change: Funded Projects, 1999-2011

*Prepared by the WSIB Research Secretariat
Updated May 1, 2012*

Introduction

The Solutions for Workplace Change competitive research grants program reflects the ongoing commitment of Ontario's Workplace Safety & Insurance Board (WSIB) to high quality occupational health and safety and workers' compensation research.

The program's purpose is to fund rigorous scientific research aimed at preventing occupational injury and disease; improving diagnosis, treatment, rehabilitation, and return to work of injured workers; studying knowledge transfer and exchange; and ensuring the early and safe return to work and fair compensation of injured workers and the appropriate assessment of employers.

The objectives of the research grants program are to support research directions that reflect the needs of Ontario workplaces, to develop a research program that meets international standards of excellence, to expand Ontario's research capacity in occupational health and safety and workers' compensation, and to coordinate WSIB-supported research in Ontario.

Solutions for Workplace Change is overseen by a multi-stakeholder Research Advisory Council (RAC), composed of representatives of researchers, workers, employers, health and safety associations, the Ministry of Labour, the Institute for Work & Health, and the WSIB. The RAC reviews all grant applications through a peer-review process, and makes funding recommendations to the WSIB Board of Directors.

The program also funds two Centres of Research Expertise: the Centre of Research Expertise on the Prevention of Musculoskeletal Disorders (CRE-MSD), administered through the University of Waterloo and directed by Dr Richard P. Wells, and the Centre of Research Expertise in Occupational Disease (CREOD), administered through the University of Toronto and St. Michael's Hospital and directed by Dr D. Linn Holness.

The program also funds, jointly with Cancer Care Ontario and the Canadian Cancer Society's Ontario Division, and in collaboration with the United Steelworkers, the Occupational Cancer Research Centre (OCRC), located at Cancer Care Ontario. It was launched in April 2009. The Centre's director is Dr Paul Demers.

This document lists all the projects that have been funded through the Research Advisory Council since the program's inception in 1999, and have either been completed or are still in progress. They are ordered by their RAC Project ID number.

What RAC Project ID Numbers Mean

Each proposal received by the WSIB Research Advisory Council is assigned a unique, 5-digit identification number.

The first two digits of the number indicate the year in which the proposal was submitted — thus RAC #02014 means the proposal was submitted in 2002. The one exception is proposals whose ID numbers begin with '98' — these were submitted in the Council's first competition in 1999.

The third digit of the ID number indicates the type of competition in which the proposal was submitted. A '0' in the third digit position indicates the proposal was submitted in the Council's main *Solutions for Workplace Change* competition. A '1' in the third digit position indicates the proposal was submitted in the Council's supplementary *Bridging the Gap* competition. The

Council held its first *Bridging the Gap* competition in 2005. The *Bridging the Gap* competition is not necessarily held each year.

The last two digits of the ID uniquely identify a proposal within a competition year and competition type. They are assigned to submissions sequentially as they are received by the Research Secretariat.

The list of funded projects begins on page 31. The members of the WSIB Research Advisory Council are listed on page 99.

The findings of completed research projects are available in summary form on the WSIB website at <http://www.wsib.on.ca> (About Us → Resources → Research).

For more information, contact the WSIB Research Secretariat at (416) 344-6913, email to research_secretariat@wsib.on.ca, or visit the WSIB website.

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HEARING PROTECTORS, SAFETY GLASSES, AND RESPIRATORY PROTECTIVE EQUIPMENT IN COMBINATION: EFFECT ON SOUND ATTENUATION (#98003)

Principal Investigator: Sharon M. Abel (Mount Sinai Hospital)

Co-Investigator: Andrea M. Sass-Kortsak (Gage Occupational and Environmental Health, University of Toronto)

Sponsoring Institution: Mount Sinai Hospital

Two-Year Funding: \$107,885.00

This project studied the degree to which the hearing protection provided by ear muffs is compromised when worn in combination with other safety devices, such as hard hats, safety glasses, and respirators.

THE CHANGE FROM 8-HR TO 10-HR SHIFTS AT AN UNDERGROUND MINE: IDENTIFYING THE EFFECTS ON SLEEP, PERFORMANCE, SAFETY, AND SOCIAL INTERACTIONS, AND IMPLEMENTING A WORKPLACE HEALTH PROMOTION PROGRAM (#98005)

Principal Investigator: Lawrence W. Reinish (University Health Network)

Co-Investigators: J. Beyers, L. Picard (Sudbury & District Health Unit); R.J. Heslegrave (University of Toronto/St. Michael's Hospital); C.M. Shapiro (University of Toronto/Toronto Western Hospital)

Sponsoring Institution: University Health Network

Two-Year Funding: \$226,093.00

This study assessed the effects on workers' health and alertness of a change from three 8-hour shifts to two 10-hour shifts at an underground mine in northern Ontario.

TOWARDS DEVELOPING BETTER REHABILITATION PROTOCOLS FOR LOW BACK INJURED WORKERS (#98007)

Principal Investigator: Stuart M. McGill (University of Waterloo)

Co-Investigator: Jacek Cholewicki (Yale University)

Sponsoring Institution: University of Waterloo

Two-Year Funding: \$108,710.00

This study established some markers of good spinal health and the avoidance of injury by identifying workers at risk and pointing to opportunities for preventive training.

EVALUATION OF PARTICIPATORY ERGONOMIC INTERVENTIONS IN LARGE AND SMALL BUSINESS (#98008)

Principal Investigator: Richard P. Wells (University of Waterloo)

Co-Investigators: Larry Brawley, Mardon B. Frazer, Robert Kerton, W. Patrick Neumann, Robert Norman (University of Waterloo); Donald C. Cole, Mickey Kerr, Harry S. Shannon (Institute for Work & Health)

Sponsoring Institution: University of Waterloo

Two-Year Funding: \$181,587.00

This project studied the effectiveness of a participative process in implementing ergonomic changes at a large manufacturing facility in Ontario.

CAW/MCMASTER WORK RELATED HEALTH RISKS STUDY (#98011)

Principal Investigator: Wayne Lewchuk (McMaster University)

Co-Investigators: Ted Haines (McMaster University, Occupational Health Clinics for Ontario Workers); Donald C. Cole (McMaster University); Mickey Kerr, Terry Sullivan (Institute for Work & Health); Paul Landsbergis (Cornell University); David Robertson (Canadian Auto Workers); Peter Schnall (University of California)

Sponsoring Institution: McMaster University

Two-Year Funding: \$275,000.00

This study aimed to develop solutions to prevent work-related injury and illness by identifying key aspects of work organization affecting the health and safety of workers in the automobile, automobile parts, and aerospace sectors.

DEALING WITH WORK-RELATED MUSCULOSKELETAL DISORDERS IN THE ONTARIO CLOTHING INDUSTRY (#98024)

Principal Investigator: Jonathan Eaton (Union of Needletrades, Industrial and Textile Employees)

Co-Investigators: Sue Ferrier, Mickey Kerr (Institute for Work & Health); Jennifer Gunning, Eric Frumin (Union of Needletrades, Industrial and Textile Employees); Peter Vi (Occupational Health Clinics for Ontario Workers)

Sponsoring Institution: Union of Needletrades, Industrial and Textile Employees

One-year Funding: \$89,500.00

This project studied the prevention of work-related musculoskeletal disorders in the Ontario clothing industry, and produced a widely distributed ergonomic handbook of solutions to some common problems.

ASSESSMENT OF A PERSON'S ABILITY TO FUNCTION AT WORK (#98028)

Principal Investigator: Susan Strong (McMaster University)

Co-Investigators: Susan Baptiste, Donald C. Cole, Harry S. Shannon (McMaster University); Judy Clarke, Rhoda Reardon (Institute for Work & Health); Edward Gibson (McMaster University)

Sponsoring Institution: McMaster University

Two-Year Funding: \$227,696.00

This study documented the various types of functional abilities evaluation being conducted in Ontario by various types of agencies, and some of the features of effective, useful functional abilities assessments.

BACK PAIN AND WORK DURING PREGNANCY: IDENTIFICATION OF PROBLEMS AND BIOMECHANICAL ANALYSIS (#98033)

Principal Investigator: Geneviève A. Dumas (Queen's University)

Co-Investigators: Robert Jensen, André Plamondon (Laurentian University); Michael McGrath, Joan Tranmer, Caroline Weber, Andy Leger, J. Terry Smith (Queen's University)

Sponsoring Institution: Queen's University

Two-Year Funding: \$127,550.00

This study identified the tasks that are problematic for pregnant women, and evaluated factors associated with pregnancy that increase back pain.

A COLLABORATIVE INVESTIGATION OF THE INCIDENCE OF CANCER AMONG WORKERS IN AN AUTO PARTS PLANT (#98049)

Principal Investigator: Roland Wong (Occupational Health Clinics for Ontario Workers)

Co-Investigators: Ted Haines (McMaster University); Paul Sampara (Occupational Health Clinics for Ontario Workers); G. Tomlinson (University of Toronto)

Sponsoring Institution: Occupational Health Clinics for Ontario Workers

One-Year Funding: \$71,895.00

This study investigated rates of cancer among former employees of the Bendix parts plant, and created opportunities for workers to develop the skills necessary to investigate possible adverse health outcomes resulting from their work.

RETURN-TO-WORK IN SMALL WORKPLACES: WORKERS' AND EMPLOYERS' PERSPECTIVES (#98066)

Principal Investigator: Joan M. Eakin (University of Toronto)

Co-Investigator: Judy Clarke (Institute for Work & Health)

Sponsoring Institution: University of Toronto

Two-Year Funding: \$62,028.00

This study investigated the return to work process among employers with fewer than 50 employees, from both workers' and employers' perspectives.

CONTINUOUS MONITORING OF ISOCYANATE MONOMER (#98067)

Principal Investigator: James T. Purdham (University of Toronto)

Co-Investigator: Susan M. Tarlo (University of Toronto)

Sponsoring Institution: University of Toronto

One-Year Funding: \$36,268.00

This project tested the feasibility of an infrared photoacoustic detector for continuous and short-term real-time monitoring of isocyanate monomer concentrations of workplace air.

EVALUATION OF DIESEL PARTICULATE FILTER SYSTEMS AT INCO'S STOBIE MINE IN SUDBURY (#98069)

Principal Investigator: Jozef Stachulak (Inco Limited, Diesel Emissions Evaluations Program)

Co-Investigators: M. Grenier (CANMET Mining & Mineral Sciences Laboratory Division); A. Mayer (Consultant)

Sponsoring Institution: Inco Ltd.

Two-Year Funding: \$100,000.00

This study developed selection criteria of high quality, reliable particulate filter systems to achieve the lowest possible diesel particulate matter emissions in hardrock mines.

CARPAL TUNNEL SYNDROME—MORBIDITY AND MANAGEMENT OUTCOMES IN ONTARIO (#98070)

Principal Investigator: Ralph T. Manktelow (Toronto General Hospital)

Co-Investigators: P. Binhammer, J.P. Szalai (Sunnybrook and Women's College Health Sciences Centre); V. Bril (Toronto General Hospital)

Sponsoring Institution: Toronto General Hospital

Two-Year Funding: \$205,025.00

This study assessed the various treatments and predictors of carpal tunnel syndrome to help decrease the cost of this illness for the employer, and the debilitating discomfort for the worker.

EFFECTS OF JOB STRAIN, HOSPITAL ORGANIZATIONAL FACTORS AND INDIVIDUAL CHARACTERISTICS ON WORK-RELATED DISABILITY AMONG NURSES (#98073)

Principal Investigators: Judith Shamian (Mount Sinai Hospital); Linda O'Brien-Pallas (University of Toronto)

Co-Investigators: Mickey Kerr, Mieke Koehoorn, Sheilah Hogg-Johnson (Institute for Work & Health); Harry Shannon (McMaster University); Donna Thomson (WHO Collaborating Centre/Mount Sinai Hospital); Linda Aiken, Julie Solcholski (University of Pennsylvania)

Sponsoring Institution: Mount Sinai Hospital

Two-Year Funding: \$269,725.00

This project analyzed several large databases to explore the injury trends of nurses in acute-care hospitals in Ontario in 1990-1998, a period of reorganization and downsizing.

STUDY TO IMPROVE DIAGNOSTIC METHODS FOR REPETITIVE STRAIN INJURIES SUCH AS CARPAL TUNNEL SYNDROME (#98074)

Principal Investigator: Ronald A. House (St. Michael's Hospital)

Co-Investigator: Michael Wills (St. Michael's Hospital)

Sponsoring Institution: St. Michael's Hospital

Two-Year Funding: \$121,010.00

This study aimed to improve the accuracy and usefulness of laboratory tests of nerve function use to diagnose and screen for peripheral nerve injury in manual workers.

OCCUPATIONAL HISTORIES OF ESSEX COUNTY CANCER PATIENTS (#98079)

Principal Investigator: Kevin M. Gorey (University of Windsor)

Co-Investigators: James Brophy, Deborah Hellyer (Occupational Health Clinics for Ontario Workers); Margaret M. Keith (Windsor Occupational Health Information Service); Ethan Laukkanen (Windsor Regional Cancer Centre)

Sponsoring Institution: University of Windsor

Two-Year Funding: \$248,000.00

The study examined the potential occupational risk factors for the development of laryngeal and breast cancer in patients to help document and identify occupational and environmental risk factors, and provide preventive strategies.

THE NEEDS AND EXPERIENCES OF INJURED WORKERS: A PARTICIPATORY RESEARCH PROCESS (#98086)

Principal Investigator: Bonnie Kirsh (University of Toronto)

Co-Investigators: Barbara Beardwood (York University); Michael Polanyi (Institute for Work & Health); Lynn Cockburn, Pat McKee (University of Toronto); Karl Crever (Ontario Network of Injured Workers); Costanza Duran (Injured Workers' Consultants); Catherine Fenech (Injured Workers); Alfred Jean-Baptiste (East End Literacy); Gerry LeBlanc (United Steelworkers of America)

Sponsoring Institution: University of Toronto

Two-Year Funding: \$130,266.00

This study surveyed injured workers about their experiences with returning to work after an injury, receiving health care, and workers' compensation. In-depth interviews were conducted with some workers who had experienced difficulties in these areas.

OUTCOMES IN CONTACT DERMATITIS (#98088)

Principal Investigator: D. Linn Holness (St. Michael's Hospital)

Sponsoring Institution: St. Michael's Hospital

One-year Funding: \$61,280.00

This study described preventive strategies and return to work processes used by workers with contact dermatitis and evaluated intervention programs that will help reduce the incidence of this disease and its adverse effects.

THE ROLE OF THE SUPERVISOR IN ACCIDENT PREVENTION (#98092)

Principal Investigator: John Lewko (Laurentian University)

Co-Investigators: Jose A. Blanco (Blanco Mialhe Association); Robert J. Flynn (University of Ottawa); David W. Gillingham (Dublin Institute of Technology); Donald W. Hine, Kenneth C. Teed (Laurentian University); Nancy E. Lightfoot (Northeastern Ontario Regional Cancer Centre)

Sponsoring Institution: Laurentian University

Two-Year Funding: \$206,743.00

This study aimed to strengthen workplace supervisory practices and improve accident prevention by examining barriers to the growth of the internal responsibility system in the mining industry.

UNDERGROUND MOBILE TRACKLESS EQUIPMENT VISIBILITY INVESTIGATION (#98096)

Principal Investigator: Alan W. Salmoni (Laurentian University)

Co-Investigators: Jim Cluff (Mines and Aggregates Safety and Health Association); Tammy R. Eger

(Mines and Aggregates Safety and Health Association/Laurentian University); Yves Lajoie, Robert Whissell (Laurentian University)

Sponsoring Institution: Laurentian University

Two-Year Funding: \$41,728.00

This project studied the design of large underground mining vehicles to improve visibility for drivers and help reduce fatalities and serious injuries. The research team also studied the role of contrast and luminance in the visibility of underground objects.

DEVELOPMENT OF A NEW TOOL TO ASSESS DISABILITY IN CUMULATIVE TRAUMA DISORDERS (CTD) (#00003)

Principal Investigator: Brenda Brouwer (Queen's University)

Co-Investigator: Matt Faris (Queen's University)

Sponsoring Institution: Queen's University

Two-Year Funding: \$65,350.00

This study tested the sensitivity, reliability, and validity of an investigational software tool for the early detection of cumulative trauma disorders.

EVALUATION OF WORK-RELATED SYMPTOMS, ASTHMA, SENSITIZATION AND EXPOSURES AMONG X-RAY TECHNOLOGISTS (#00004)

Principal Investigator: Gary M. Liss (University of Toronto)

Co-Investigators: Mickey Kerr (Institute for Work & Health); Lisa McCaskell (Ontario Public Health Services Employees Union); James T. Purdham, Susan M. Tarlo (University of Toronto)

Sponsoring Institution: University of Toronto

Two-Year Funding: \$235,463.00

This project studied occupational asthma in radiation technologists to determine whether radiological technologists have excess work-related respiratory and adult-onset asthma.

ACCEPTANCE CRITERIA FOR, AND CAPABILITIES OF, LINERS FOR MITIGATING GROUND FALLS IN MINES (#00007)

Principal Investigator: James F. Archibald (Queen's University)

Co-Investigator: P.D. Katsabanis (Queen's University)

Sponsoring Institution: Queen's University

Two-Year Funding: \$183,252.00

This study assessed the capabilities of various spray-on polymer materials for preventing ground falls in underground mines.

MORTALITY, CANCER INCIDENCE, AND WORKPLACE EXPOSURES AMONG ONTARIO CONSTRUCTION WORKERS (#00008)

Principal Investigator: Murray M. Finkelstein (McMaster University)

Co-Investigators: Dave K. Verma, Lawrence A. Kurtz (McMaster University); Dru Sahai (Construction Safety Association of Ontario); Joe DeWit (Asbestos Workers Local 95); Evelyn Stefov (Ministry of Labour)

Sponsoring Institution: McMaster University

Two-Year Funding: \$272,500.00

This study assessed the risk to construction workers exposed to asbestos, silica, cement, diesel fumes, and wood dust.

A SURVEY OF DISABILITY MANAGEMENT APPROACHES IN ONTARIO WORKPLACES (#00009)

Principal Investigator: Renee M. Williams (McMaster University)

Co-Investigators: Muriel Westmorland (McMaster University); John Lavis, Harry S. Shannon (McMaster University, Institute for Work & Health); Benjamin C. Amick III (University of Texas)

Sponsoring Institution: McMaster University

Two-Year Funding: \$232,443.00

This project aimed to identify disability management programs that are available in Ontario workplaces, examine their relationship to return to work, and assess the effectiveness of best practices in workplace disability management.

ORGANIZATIONAL CHANGE AND THE HEALTH WELL BEING OF HOME CARE WORKERS (#00011)

Principal Investigator: Margaret Denton (McMaster University)

Co-Investigators: Isik Urla Zeytinoglu, Sharon Webb (McMaster University)

Sponsoring Institution: McMaster University

Two-Year Funding: \$221,044.00

This project sought to uncover and provide new information to improve the prevention of work-related injury and illnesses in home care work.

OCCUPATIONAL EXPOSURE TO METALWORKING FLUIDS: AN ASSESSMENT OF ANALYTICAL METHODS AND SIZE SELECTIVE AIR SAMPLING TECHNIQUES (#00012)

Principal Investigator: Dave K. Verma (McMaster University)

Co-Investigators: Don Shaw, Lorraine Shaw (McMaster University)

Sponsoring Institution: McMaster University

Two-Year Funding: \$153,000.00

This project studied occupational exposures to metalworking fluids associated with respiratory and allergic skin disorders.

ORGANIZATIONAL FACTORS, MANAGEMENT COMMITMENT AND WORKPLACE SAFETY (#00013)

Principal Investigator: Harry Shannon (McMaster University)

Co-Investigators: Lynne Lohfeld (McMaster University); John Gilbert (University of Toronto)

Sponsoring Institution: McMaster University

Two-Year Funding: \$249,977.00

This project aimed to understand changes in workplace occupational health and safety policies, practices, and attitudes in the past 10 years in manufacturing and retail establishments in Ontario.

PREVALENCE OF RETURN TO WORK PROGRAMS IN THE MANUFACTURING SECTOR, AS DEFINED BY THE WORKPLACE SAFETY AND INSURANCE BOARD (#00015)

Principal Investigator: Sharon L. Switzer-McIntyre (University of Toronto)

Co-Investigators: D. Linn Holness, Susan Jaglal, Cheryl Cott (University of Toronto)

Sponsoring Institution: University of Toronto

Two-Year Funding: \$102,089.00

This project described the prevalence and the component parts of return to work programs within the manufacturing sector of Ontario workplaces.

CONNECTING FOR CHANGE: INJURED WORKERS IN NORTHWESTERN ONTARIO AND THE EFFECTIVENESS OF PEER SUPPORT (#00017)

Principal Investigator: Sharon Dale Stone (Lakehead University)

Co-Investigators: Thomas Dunk, Mary Ellen Hill (Lakehead University); Eugene Lefrancois, Ken Kawchuk (Injured Workers' Support Group); Steve Mantis (Canadian Injured Workers Alliance); Bart Pilato (New Directions Workers)

Sponsoring Institution: Lakehead University

One-Year Funding: \$79,937.00

This project developed a questionnaire to explore injured workers' use of peer supports in Northwestern Ontario.

IMPROVING WORK ORGANIZATION TO REDUCE INJURY AND ILLNESS: SOCIAL SERVICES, STRESS, VIOLENCE AND WORKLOAD (#00018)

Principal Investigator: Donna Baines (McMaster University)

Co-Investigators: Wayne Lewchuk (McMaster University); Anthony Pizzino, Margot Young (Canadian Union of Public Employees); Antti Saloniemi (University of Tampere [Finland]); Anne Sylvia Brooker (Institute for Health and Society)

Sponsoring Institution: McMaster University

Two-Year Funding: \$148,997.00

This project explored the organizational factors that contribute to injuries and illnesses in the restructured social services sector, and suggested some solutions.

REPRODUCTIVE HEALTH AMONG NICKEL REFINERY WORKERS (#00021)

Principal Investigator: Evert Nieboer (McMaster University)

Co-Investigators: Valeri Tchachtchine (Kola Research Laboratory for Occupational Health [Russia]); Eiliv Lund, Jon Oyvind Odland (University of Tromso [Norway]); Yngvar Thomassen (National Institute of Occupational Health [Oslo, Norway]); Steven Schrader (National Institute for Occupational Safety and Health [USA]); Ted Haines (McMaster University)

Sponsoring Institution: McMaster University

Two-Year Funding: \$150,000.00 (co-funded with the Nickel Producers Environmental Research Association)

This study, conducted in the Kola Peninsula of Russia, examined the causal relationship between occupational exposure to nickel compounds and pregnancy loss, pregnancy complications, and reduced birth weight.

RESPIRATORY DISEASE RELATED TO METALWORKING FLUID EXPOSURE (#00022)

Principal Investigator: Ted Haines (McMaster University)

Co-Investigators: David Muir (McMaster University); Gary M. Liss (University of Toronto); Freddy Hargreave (McMaster University); Mark Jany, David Fishbein (St. Catharines Hospital); Jim D'Arcy (General Motors Research & Development Centre); John Oudyk (Occupational Health Clinics for Ontario Workers)

Sponsoring Institution: Occupational Health Clinics for Ontario Workers

Two-Year Funding: \$299,882.00

This project will examine the association between asthma and metalworking fluid particularly with respect to certain exposure circumstances, locations, and work practices.

DUPUYTREN'S CONTRACTURE AND OCCUPATION: A PROPOSAL FOR A CASE-CONTROL STUDY (#00023)

Principal Investigator: Carolyn M. Levis (McMaster University)

Co-Investigators: Ted Haines, Achilleas Thoma, Karen Veltri, Stephen Walter, Charles Goldsmith (McMaster University); Gary Liss (Gage Occupational & Environmental Health Unit, University of Toronto); Cheryl Rook, Helen McRobbie (Occupational Health Clinics for Ontario Workers); Susan Stock (Montreal Department of Public Health)

Sponsoring Institution: McMaster University

Two-Year Funding: \$234,618.00

This project is a study of Dupuytren's contracture, a disease of the palmar fascia resulting in thickening and contracture of fibrous bands on the palmar surface of the hands and fingers. The project will study the association between the condition and manual work.

PREVENTION OF WMSD IN THE ONTARIO CLOTHING INDUSTRY: A FOCUS ON SMALL BUSINESS (#00030)

Principal Investigator: Richard P. Wells (University of Waterloo)

Co-Investigators: Jonathan Eaton, Tullia Marcolongo, Eric Frumin, Julianne Natale (Union of Needletrades, Industrial, and Textile Employees); Mickey Kerr, Sue Ferrier (Institute for Work & Health); Syed Naqvi (Occupational Health Clinics for Ontario Workers)

Sponsoring Institution: University of Waterloo

Two-Year Funding: \$250,240.00

This study implemented and evaluated ergonomics programs aimed at preventing work-related musculoskeletal disorders in Ontario's clothing industry.

EXPOSURE TO WHOLE BODY VIBRATION IN MINING, TRANSPORTATION AND CONSTRUCTION (#00031)

Principal Investigator: Alan W. Salmoni (Laurentian University)

Co-Investigators: Joel Andersen (Occupational Health Clinics for Ontario Workers); Tammy R. Eger (Mining and Aggregates Safety and Health Association); Ted Gardiner (Battle Mountain Canada, Holloway Mine); Yves Lajoie, André Plamondon, Lloyd Reed (Laurentian University); Nancy E. Lightfoot (Northeastern Ontario Cancer Research Centre); Kamlesh Prajapati (Boart Longyear, NorthBay)

Sponsoring Institution: Laurentian University

Two-Year Funding: \$108,440.00

The study used a triaxial accelerometer to assess the exposure of the operators of various types of vehicles to whole body vibration in mining, transportation, and construction.

SAFE WORK LIMITS WHILE WEARING FIREFIGHTING PROTECTIVE CLOTHING (#01005)

Principal Investigator: Tom M. McLellan (Defence Research and Development Canada)

Sponsoring Institution: Defence and Research Development Canada

Two-Year Funding: \$197,903.00

This study established safe work times for firefighters wearing protective clothing and self-contained breathing apparatus. It also tested the benefits of hydration before and after work in the heat while wearing their protective ensemble, and the effectiveness of different recovery cooling strategies on subsequent work performance.

MATERNAL OCCUPATIONAL EXPOSURE TO ORGANIC SOLVENTS DURING PREGNANCY AND INFANT VISUAL PROCESSING (#01006)

Principal Investigator: Joanne Rovet (The Hospital for Sick Children)

Co-Investigators: Carol Westall, Gideon Koren, Christine Till (The Hospital for Sick Children)

Sponsoring Institution: University of Toronto

Two-Year Funding: \$250,800.00

This study examined whether prenatal solvent exposure impairs selective aspects of infants' visual processing, namely colour vision and visual acuity. A secondary objective was to determine whether visual impairments underlie more general deficits in subsequent neurocognitive functioning.

FUNCTIONAL AND CELLULAR ALTERATIONS TO WORK-RELATED REPETITIVE TASKS (#01008)

Principal Investigator: Howard J. Green (University of Waterloo)

Co-Investigators: Donald A. Ranney, Richard L. Hughson (University of Waterloo)

Sponsoring Institution: University of Waterloo

Two-Year Funding: \$85,184.00

This study examined the feasibility of conducting a full-scale study into identifying the biological mechanisms of work-related musculoskeletal disorders by developing and standardizing needed procedures, recruiting the required worker sample, and obtaining preliminary insights into the difference in muscle structure and composition between myalgia patients and healthy controls.

MOBILE MINING EQUIPMENT OPERATOR VISIBILITY INVESTIGATION (#01018)

Principal Investigator: Alan W. Salmoni (Laurentian University)

Co-Investigators: Tammy R. Eger, Robert Whissell, Yves Lajoie (Laurentian University); Jim Cluff (Mining and Aggregates Safety and Health Association)

Sponsoring Institution: Laurentian University

Two-Year Funding: \$125,620.00

Mobile equipment such as Load Haul Dump vehicles (LHDs) and haulage trucks are used extensively in the mining industry. This study used a computer simulation tool to evaluate and recommend design guidelines for these vehicles to improve operator visibility.

**MANAGING THE HEALTH AND SAFETY INTERESTS OF YOUNG WORKERS
IN SMALL BUSINESS (#01019)**

Principal Investigators: Huguette Blanco, John H. Lewko (Laurentian University)

Co-Investigators: Rolland LeBrasseur, Kate Tilleczeck (Laurentian University); Richard Volpe (University of Toronto/Ontario Institute for Studies in Education); Bonnie-Jean Wilson (Ontario Service Safety Alliance)

Sponsoring Institution: Laurentian University

Two-Year Funding: \$261,032.00

This study sought an in-depth understanding of the realities and perceptions of young employees and of small business owners/managers regarding their jobs, training, and safety.

PREVENTING YOUNG WORKER INJURIES (#01022)

Principal Investigator: Kathryn L. Woodcock (Ryerson University)

Co-Investigators: Maurice Mazerolle, Carolyn Johnson & RWSC Steering Committee (Ryerson University)

Sponsoring Institution: Ryerson University

One-year Funding: \$10,683.00

This proposal explored the feasibility of developing a data-based model to identify the causal pathways that differentiate injured young workers from never-injured young workers.

REDUCING RISK OF MUSCULOSKELETAL DISORDERS AND PROMOTING RETURN-TO-WORK THROUGH THE USE OF REBAR TYING MACHINES (#01023)

Principal Investigator: Tony Almeida (International Association of Bridge Structural & Ornamental Iron Workers, Local 721)

Co-Investigators: Peter Vi, Nadine Marks (Construction Safety Association of Ontario)

Sponsoring Institution: International Association of Bridge Structural & Ornamental Iron Workers, Local 721

Two-Year Funding: \$42,500.00

The study investigated the biomechanical and ergonomic differences between manual tying and using a rebar-tying machine.

**HAVS IMPAIRMENT AND DISABILITY COMPARISONS USING THE DASH
QUESTIONNAIRE (#01031)**

Principal Investigator: Ronald A. House (St. Michael's Hospital)

Co-Investigators: Michael Wills (St. Michael's Hospital); Gary M. Liss, Sharon L. Switzer-McIntyre (University of Toronto)

Sponsoring Institution: University of Toronto

Two-Year Funding: \$91,760.00

This study will investigate the relationship between measured disability using the Disabilities of the Arm, Shoulder, and Hand (DASH) questionnaire and the objective impairment in Hand Arm Vibration Syndrome (HAVS).

BENEFITS AND COSTS OF ERGONOMIC CHANGE (#01041)

Principal Investigator: Richard P. Wells (University of Waterloo)

Co-Investigators: Larry Brawley, Mardon B. Frazer, Robert Norman, Nancy Theberge, Robert Kerton (University of Waterloo); Donald C. Cole, Mickey Kerr, Harry S. Shannon, (Institute for Work and Health)

Sponsoring Institution: University of Waterloo

Two-Year Funding: \$270,756.00

This project aimed to develop the tools for the evaluation and design of work involving the upper extremity, the evaluation of a participative process for implementing ergonomic change, and the effect of the change process on a number of outcome measures, including exposures and health.

TOWARDS BEST PRACTICES OF FUNCTIONAL ASSESSMENT: AN INNOVATIVE MODEL FOR RESEARCH DISSEMINATION (#01043)

Principal Investigator: Susan A. Strong (McMaster University)

Co-Investigators: Maureen Dobbins, Susan Baptiste, Marcos Costa, Edward Gibson (McMaster University); Michael Polanyi, Judy Clarke (Institute for Work & Health)

Sponsoring Institution: McMaster University

Two-Year Funding: \$253,569.00

This study aimed to develop and evaluate a new participatory research dissemination method involving joint researcher-user interaction, collective learning, and collaborative change.

OCCUPATIONAL EXPOSURES TO CHEMICAL, BIOLOGICAL, AND PHYSICAL AGENTS IN ONTARIO SAWMILLS AND VENEER/PLYWOOD PLANTS (#02001)

Principal Investigator: Dave K. Verma (McMaster University)

Co-Investigators: Murray M. Finkelstein (McMaster University); Cecil Demers, John Murray (Ontario Forestry Safe Workplace Association)

Sponsoring Institution: McMaster University

One-Year Funding: \$30,000.00

This development project investigates industry-wide occupational exposures and resultant health effects in Ontario sawmills and veneer/plywood plants, through consultation with interested parties, visits to a sample of various facilities in different regions and of different sizes, and walk-through surveys.

THE HEALTH AND SAFETY CONSEQUENCES OF UNDEREMPLOYMENT AND CONTINGENT WORK (#02006)

Principal Investigator: Emile Tompa (Institute for Work & Health)

Co-Investigators: John Lavis, Cameron A. Mustard (Institute for Work & Health)

Sponsoring Institution: Institute for Work & Health

Two-Year Funding: \$13,024.00 (co-funded with the Canadian Institutes for Health Research)

The researchers investigated the health consequences of two increasingly prevalent labour market experiences, unemployment and contingent work.

INCIDENCE AND CORRELATES OF LOST-TIME CLAIMS AMONG ADOLESCENTS AND YOUNG ADULTS IN ONTARIO AND BRITISH COLUMBIA (#02007)

Principal Investigator: F. Curtis Breslin (Institute for Work & Health)

Co-Investigators: Mieke Koehoorn (University of British Columbia); Cameron A. Mustard, Sheilah Hogg-Johnson (Institute for Work & Health)

Sponsoring Institution: Institute for Work & Health

Two-Year Funding: \$147,844.00

This study aims to describe lost time workers' compensation claims by individual, work, and community variables in Ontario and British Columbia between 1990-2001.

THE IMPACT OF WAITING FOR ROTATOR CUFF SURGERY (#02011)

Principal Investigator: Joy C. MacDermid (McMaster University)

Co-Investigators: Ken Faber, Darren Drosdowech, Don Atkinson (St. Joseph's Health Centre)

Sponsoring Institution: St. Joseph's Health Centre

Two-Year Funding: \$137,865.00

This project aims to define the impact of waiting for rotator cuff surgery including the disability experienced while waiting for the surgery, and the effect of waiting on outcomes, ability to return to work, and financial costs.

CLINICAL INDICATORS FOR TENDON INJURIES (#02014)

Principal Investigator: Guy Trudel (University of Ottawa)

Co-Investigators: Hans Unthoff, Martin Lecompte, Leonard Avruch (Ottawa Hospital General Campus); David Backman (University of Ottawa)

Sponsoring Institution: University of Ottawa

Two Year Funding: \$272,504.00

This study validated clinical indicators of tendonitis by obtaining clinical, histological, and mechanical data on tendonitis and correlated them with clinical tests.

PREVENTING CHRONIC DISABILITY: A SUBACUTE COGNITIVE-BEHAVIOURAL DISABILITY MANAGEMENT PROGRAM FOR OCCUPATIONAL INJURIES OF THE LOWER BACK (#02015)

Principal Investigator: Dean Tripp (Queen's University)

Co-Investigators: Joan M. Stevenson, Matthew Faris, Wilma Hopman (Queen's University); Anne Symes, Nomusa Mngoma (Providence Continuing Care Centre)

Sponsoring Institution: Queen's University

Two-Year Funding: \$191,200.00

This study investigated whether a 5-session cognitive-behavioural disability management program can get workers with sub-acute low-back pain back to work earlier, reduce sick absenteeism, reduce health care use, and improve quality of life.

OCCUPATIONAL EXPOSURE TO ULTRAFINE PARTICLES AND THE RELATIONSHIP TO EARLY INDICATORS OF CARDIOPULMONARY EFFECTS (#02031)

Principal Investigator: James T. Purdham (University of Toronto)

Co-Investigators: Andrea M. Sass-Kortsak, Susan M. Tarlo, Gary M. Liss, Frances Silverman (University of Toronto)

Sponsoring Institution: University of Toronto

Two-Year Funding: \$268,428.00

The project will investigate a possible association between occupational exposure to ultra-fine particles and adverse health effects, especially cardiopulmonary diseases.

BARRIERS TO DIAGNOSIS OF WORK-RELATED ASTHMA (#02032)

Principal Investigator: Susan M. Tarlo (University of Toronto)

Co-Investigators: Gary M. Liss (University of Toronto)

Sponsoring Institution: University of Toronto

Two-Year Funding: \$117,000.00

This study aimed to identify some of the factors behind delays in diagnosing occupational asthma to help achieve better prognoses for occupational asthma sufferers.

DEFINING THE ROLE OF ELECTRODIAGNOSTIC TESTING IN THE EVALUATION OF CARPAL TUNNEL SYNDROME (#02033)

Principal Investigator: Brent Graham (University Health Network)

Co-Investigator: Peter Ashby (University Health Network)

Sponsoring Institution: University Health Network

Two-Year Funding: \$45,472.00

The purpose of this research is to study the role of electrodiagnostic tests in the diagnosis of carpal tunnel syndrome.

ERGONOMIC AND HYGIENE INTERVENTIONS TO IMPROVE THE HEALTH AND SAFETY OF DRYWALL FINISHING WORKERS (#02034)

Principal Investigator: Greg Smith (International Union of Painters and Allied Trades D.C. 46)

Co-Investigators: Hugh Laird (Interior Systems Contractors Association of Ontario); Peter Vi, Dru Sahai (Construction Safety Association of Ontario)

Sponsoring Institution: International Union of Painters and Allied Trades D.C. 46

One-Year Funding: \$59,487.00

This project studied whether use of a pneumatic finishing system reduces the risk of musculoskeletal injuries for drywall finishing workers, and whether a drywall sanding system can reduce the risk of dust exposure for drywall workers.

PHYSICIAN OCCUPATIONAL DISEASE PRACTICE SURVEY (#02036)

Principal Investigator: D. Linn Holness (St. Michael's Hospital)

Co-Investigators: Susan M. Tarlo (St. Michael's Hospital); Gary M. Liss, Frances Silverman (University of Toronto)

Sponsoring Institution: St. Michael's Hospital

One-year Funding: \$73,762.00

The study evaluated the practice patterns of community physicians, their perceived level of knowledge and adequacy of training with respect to occupational contact dermatitis and occupational asthma. The study examined the barriers that exist to recognizing and managing these diseases properly, the time constraints, and various other factors. The outcomes of this study help achieve earlier diagnosis and better treatment and management of these diseases.

THE VALIDATION OF A CLASSIFICATION SYSTEM FOR WORK-RELATED DISORDERS OF THE SHOULDER AND ELBOW (#02039)

Principal Investigator: Dorcas E. Beaton (St. Michael's Hospital)

Co-Investigators: Robin Richards (Sunnybrook and Women's College Health Sciences Centre); Sheilah Hogg-Johnson (Institute for Work & Health)

Sponsoring Institution: St. Michael's Hospital

Two-Year Funding: \$159,556.00

This project aims to further develop and study a classification system for work-related musculoskeletal disorders of the shoulder and elbow that has been previously established with patients who consulted in a specialty clinic at St. Michael's Hospital in Toronto.

PATERNAL EXPOSURE TO IONIZING RADIATION IN ONTARIO URANIUM MINERS AND RISK OF CONGENITAL ANOMALY IN OFFSPRING: A RECORD LINKAGE CASE CONTROL STUDY (#02041)

Principal Investigator: Loraine D. Marrett (Cancer Care Ontario)

Co-Investigators: John McLaughlin (Samuel Lunenfeld Research Institute); Douglas Chambers (SENES Consultants Ltd.)

Sponsoring Institution: Cancer Care Ontario

Two-Year Funding: \$11,530.00 (co-funded with the Canadian Institutes for Health Research)

This project conducted a population-based record linkage case-control study to determine if offspring of male Ontario uranium miners exposed to ionizing radiation are at increased risk of congenital anomaly.

RELATIONSHIP OF TREATMENT-RELATED FACTORS TO SUSTAINED VOCATIONALLY RELEVANT OUTCOMES OF INJURED WORKERS WITH CHRONIC PAIN FOLLOWING MULTIDISCIPLINARY TREATMENT (#02043)

Principal Investigators: Douglas S. Saunders, Erika J. Runions (University Health Network)

Co-Investigators: David Etlin (University Health Network)

Sponsoring Institution: University Health Network

Two-Year Funding: \$155,546.00

This study will examine the effect of four sets of variables on vocational outcomes of workers with chronic pain disability.

THE DEVELOPMENT OF A RELIABLE AND VALID MEASURE OF ACUTE AND CHRONIC STRESSORS IN POLICING (#02051)

Principal Investigator: Donald R. McCreary (Defence Research and Development Canada)

Co-Investigators: Megan Thompson, Luigi Pasto (Defence Research and Development Canada)

Sponsoring Institution: Defence Research and Development Canada

One-Year Funding: \$29,342.00

This project developed a short, psychometrically validated measure of acute and chronic stressors associated with policing.

DRIVING PEDAL REACTION TIMES FOLLOWING TRAUMATIC RIGHT BELOW KNEE AMPUTATIONS (#03003)

Principal Investigators: Benjamin Meikle (St. John's Rehabilitation Hospital); Michael Devlin (West Park Healthcare Centre)

Co-Investigator: Christos Boulias (West Park Healthcare Centre)

Sponsoring Institution: St. John's Rehabilitation Hospital

One-year Funding: \$11,921.00

This study measured the driving pedal reaction times of right below knee amputees using a number of different techniques of operating the foot pedals. The study helps determine whether right below knee amputees can safely operate vehicle foot pedals with their prostheses, and which technique of operating the foot pedals is associated with the fastest reaction times.

PHYSICIAN-DIAGNOSED ASTHMA, RESPIRATORY AND CUTANEOUS SYMPTOMS, IMMUNOLOGIC SENSITIZATION, AND EXPOSURES AMONG CLEANERS (#03007)

Principal Investigators: Susan M. Tarlo, Gary M. Liss (University of Toronto)

Co-Investigators: James T. Purdham, Andrea M. Sass-Kortsak (University of Toronto); D. Linn Holness (St. Michael's Hospital)

Sponsoring Institution: University of Toronto

Two-Year Funding: \$295,240.00

Recent surveys from several countries have indicated that as a group, cleaners are at increased risk of developing asthma. The study will assess how commonly asthma and respiratory symptoms occur in cleaners as compared with other office workers who are not cleaners.

GROUND FALL MITIGATION CAPABILITY AND ENHANCED TESTING FOR ROCKBURST SUSCEPTIBILITY OF ROCK LINERS (#03010)

Principal Investigator: James F. Archibald (Queen's University)

Co-Investigator: P. D. Katsabanis (Queen's University)

Sponsoring Institution: Queen's University

Two-Year Funding: \$150,002.00

This study continued previously-funded work on characterizing support capabilities of conventional and innovative types of spray-on rock lining materials in underground mines.

LINE-OF-SIGHT ISSUES WITH TELE-REMOTE AND CONVENTIONAL LOAD HAUL DUMP VEHICLES (#03019)

Principal Investigator: Paul G. Dunn (Laurentian University/MIRARCO)

Co-investigators: Robert Whissel, Tammy R. Eger (Laurentian University)

Sponsoring Institution: Laurentian University

Two-Year Funding: \$153,400.00

This project used Laurentian University's new state-of-the-art Virtual Reality Laboratory (VRL) to recreate underground excavation and equipment profiles in 3-D stereo, analyze line-of-sight design issues associated with underground vehicles, and demonstrate the findings to industry, union, government, and other researchers.

STRESS, TRAUMA, AND RECOVERY IN THE WORKPLACE: EARLY STAGE STUDIES (#03022)

Principal Investigator: Ruth A. Lanius (University of Western Ontario)

Co-Investigators: Peter Williamson, Richard Neufeld (University of Western Ontario); Nicholas Coupland, Kathleen Hegadoren, Brian Rowe (University of Alberta); Ravi Menon (Robarts Research Institute)

Sponsoring Institution: University of Western Ontario

Two-Year Funding: \$300,000.00

This study will compare the physiological changes that occur in individuals who develop post-traumatic stress disorder (PTSD) with those that occur in individuals who recover from a traumatic incident by measuring both the levels of several stress hormones and neural activity at one to two weeks versus five to six weeks after a traumatic workplace accident. A better

understanding of the etiology of PTSD will lead to earlier intervention and may also help in the development of better treatments.

UPPER EXTREMITY STRENGTH IN THE AGING WORKFORCE (#03024)

Principal Investigator: Mardon B. Frazer (University of Waterloo)

Sponsoring Institution: University of Waterloo

Two-Year Funding: \$250,390.00

The goal of this study is to produce a database of upper limb strength, for men and women ranging in age from 30-69. This information may then be used by people employed in jobs that design, evaluate, or modify work, those that evaluate or rehabilitate workers for work return, and individuals that place or assign workers to specific jobs.

ATTITUDES AND INCIDENT CAUSAL MODELING FOR CONSTRUCTION (#03026)

Principal Investigator: Brenda Y. McCabe (University of Toronto)

Co-Investigators: Douglas Edward Hyatt, Catherine Loughlin (University of Toronto); Susan Tighe (University of Waterloo)

Sponsoring Institution: University of Toronto

Two-Year Funding: \$252,000.00

The purpose of this study is to initialize a construction-focused program for safety management, and develop a probabilistic model of workplace safety.

A STUDY OF THE HANDS-FREE TECHNIQUE'S EFFECTIVENESS IN REDUCING OPERATING ROOM PERCUTANEOUS INJURIES AND CONTAMINATIONS AND THE EFFECTIVENESS OF AN EDUCATIONAL VIDEO (#03046)

Principal Investigator: Bernadette Stringer (University of Western Ontario)

Co-Investigators: Ted Haines, Jennifer Blythe, Ved Tandan (McMaster University); Kenneth Harris, Francine Lortie-Monette (University of Western Ontario); Ramon Berguer (University of California Davis School of Medicine); Charlie Goldsmith (Centre for Evaluation of Medicines)

Sponsoring Institution: University of Western Ontario

Two-Year Funding: \$234,064.00

This study will (1) develop an educational video about the use of the 'hands-free technique' in operating rooms as a means of reducing exposure risk to blood and body fluid; (2) evaluate, through a before-and-after study in five Ontario hospitals, if use of the hands-free technique does reduce risk of exposure; and (3) determine if viewing the video encourages operating room personnel to increase use of the technique immediately and over time.

EVALUATION OF WHOLE-BODY VIBRATION, SEAT DESIGN & PERFORMANCE, AND SITTING POSTURE IN LARGE MOBILE EQUIPMENT (#03049)

Principal Investigators: Alan W. Salmoni (University of Western Ontario); Tammy R. Eger (Laurentian University); Paul-Émile Boileau (Institut de recherche en santé et en sécurité du travail du Québec)

Co-Investigators: André Plamondon, Alain Delisle (Institut de recherche en santé et en sécurité du travail du Québec); Joan M. Stevenson (Queen's University); Christian LaRiviere (PRIVICAP); Peter Vi (Construction Safety Association of Ontario); Sylvain G. Grenier (Laurentian University/Occupational Health Clinics for Ontario Workers)

Sponsoring Institution: University of Western Ontario

Two-Year Funding: \$245,443.00

This project studied seat design characteristics that diminish the vibration transmitted to the operator by vehicles in the transportation, mining, and construction industries.

EMPLOYMENT STRAIN: THE HIDDEN COSTS OF PRECARIOUS EMPLOYMENT (#04003)

Principal Investigator: Wayne Lewchuk (McMaster University)

Co-Investigators: Andrew King (United Steel Workers of America); Michael Quinlan (University of New South Wales); Leah Vosko (York University)

Sponsoring Institution: McMaster University

Two-Year Funding: \$285,900.00

The Karasek 'job strain' model only partially captures the work organization characteristics of precarious employment relationships. Through the concept of 'employment strain,' this project will develop an alternative approach, and will examine the demands associated with finding and keeping work, the need to balance the demands of multiple employers, the level of control over future employment prospects, the extent of continuous renegotiation of the terms and conditions of employment, and levels of support in a context of temporary social relationships.

COMPARISON OF CAUSE-SPECIFIC MORTALITY RATES AMONG WORKERS IN THE ONTARIO CONSTRUCTION SECTOR (#04004)

Principal Investigator: Murray M. Finkelstein (McMaster University)

Sponsoring Institution: McMaster University

One-Year Funding: \$33,965.00

This research will assess associations between occupational exposures in the construction sector and mortality from specific causes using internal comparisons (construction worker subpopulations).

CHARACTERIZATION OF MICROBIAL CONTAMINANTS IN METALWORKING FLUIDS (#04007)

Principal Investigator: James A. Scott (University of Toronto)

Co-Investigators: James T. Purdham (University of Toronto); Dave K. Verma (McMaster University); Sigmund Krajden (St. Joseph's Health Centre)

Sponsoring Institution: University of Toronto

Two-Year Funding: \$281,142.00

This project will determine the relevance of gravimetric air sampling methods to the assessment of worker exposures to microbial contaminants and their derivatives originating from metalworking fluids (MWFs). The project will identify high-risk workplace processes and procedures for MWF-related exposure to bioaerosols.

THE LOGIC OF PRACTICE: AN ETHNOGRAPHIC STUDY OF FRONT-LINE SERVICE WORK WITH SMALL BUSINESSES IN ONTARIO'S WORKPLACE HEALTH INSURANCE AGENCY (#04008)

Principal Investigator: Joan M. Eakin (University of Toronto)

Co-Investigators: Ellen MacEachen, Judy Clarke (Institute for Work & Health)

Sponsoring Institution: University of Toronto

Two-Year Funding: \$52,691.00

This project aims to generate an empirically-based understanding of how front-line WSIB staff working in the small business sector actually conceive and accomplish their work (including their professional and hands-on practical knowledge, interactions, and practices), and to draw out the implication of their practices for the OHS system, workers, and employers.

DETERMINANTS OF RETURN-TO-WORK: APPLYING THE READINESS FOR CHANGE MODEL (#04010)

Principal Investigator: Renée-Louise Franche (Institute for Work & Health)

Co-Investigators: Gail Hepburn, F. Curtis Breslin, Cameron A. Mustard, Sheilah Hogg-Johnson, Pierre Côté (Institute for Work & Health); John W. Frank (Canadian Institutes of Health Research)

Sponsoring Institution: Institute for Work & Health

Two-Year Funding: \$278,320.00

The project proposes to apply the conceptual framework of J.O. Prochaska's 'Readiness for Change' model to the return-to-work process. This will be the first attempt to apply the model—which was initially developed with respect to health-risk behaviours, where it has received strong empirical validation—to the return-to-work process.

IMPLEMENTING MECHANICAL DEVICES IN THE DRYWALL FINISHING TRADE TO PREVENT FALLS, MUSCULOSKELETAL DISORDERS, AND OCCUPATIONAL DISEASE (#04012)

Principal Investigator: Greg Smith (International Union of Painters & Allied Trades D.C. 46)

Co-Investigators: Hugh Laird (Interior Systems Contractors Association of Ontario); Peter Vi, Dru Sahai, Enzo Garritano (Construction Safety Association of Ontario)

Sponsoring Institution: International Union of Painters & Allied Trades D.C. 46

Two-Year Funding: \$238,420.00

This project aims to document the potential ergonomics, hygiene, safety, and productivity benefits that can be realized by adopting various alternative drywall finishing systems.

WORKPLACE INCIVILITY AND OTHER WORK FACTORS: EFFECTS ON PSYCHOLOGICAL DISTRESS AND HEALTH (#04016)

Principal Investigator: Harry S. Shannon (McMaster University)

Co-Investigators: Ted Haines (McMaster University); Lilia Cortina (University of Michigan)

Sponsoring Institution: McMaster University

One-Year Funding: \$112,950.00

This study will examine how issues in work life may affect mental and physical health, and the effect of disrespectful relations at work in particular. Issues of respect and incivility have recently been of increasing interest in work organization research, and 'incivility' has been suggested to be a strong predictor of various work-related and health outcomes.

MODELLING HEALTH AND WORK OUTCOMES FOLLOWING A WORK-RELATED UPPER EXTREMITY DISORDER: THE ROLE OF PERSON, INJURY, WORK DEMANDS, AND WORK ORGANIZATION (#04017)

Principal Investigator: Joy C. MacDermid (McMaster University)

Co-Investigators: Harry S. Shannon (McMaster University); Robert McMurty, James H. Roth (St. Joseph's Health Centre); Benjamin C. Amick III (University of Texas)

Sponsoring Institution: McMaster University

Two-Year Funding: \$118,304.00

This study aims to define the relative importance of the person, work demands, work-injury, and the workplace organization as mediators of health and work participation. This information will be used to develop clinical pathways for diagnosis and treatment of the injured worker based on their risk of experiencing difficulty returning to work.

FUNCTIONAL AND CELLULAR ALTERATIONS IN WORK-RELATED MUSCLE PAIN (#04018)

Principal Investigator: Howard J. Green (University of Waterloo)

Co-Investigators: Donald A. Ranney, A. Russell Tupling (University of Waterloo)

Sponsoring Institution: University of Waterloo

Two-Year Funding: \$276,202.00

This research aims to elucidate the mechanisms and functional consequences underlying work-related musculoskeletal disorders with particular regard to repetitive strain injury. The research is based on the premise that diagnosis, prevention, and rehabilitation strategies are in large part unsuccessful because of insufficient characterization of the muscle cellular pathologies involved. The research builds on an earlier feasibility study and hopes to identify conclusively the nature of cellular pathology.

USING VIRTUAL REALITY IN MINE RESCUE OPERATIONS (#04019)

Principal Investigator: Paul G. Dunn (Laurentian University)

Co-Investigators: Tammy R. Eger (Laurentian University)

Sponsoring Institution: Laurentian University

One-Year Funding: \$30,000.00

This project researched the possibility of adapting virtual reality technology for use by mine rescue groups. It created a virtual 3D mine model, and showed how the model can be used by control groups to verbally guide underground mine rescue teams during emergencies.

A COMPARISON OF POSTURE AND BACK AND UPPER EXTREMITY MUSCLE ACTIVITY DURING STANDARDIZED COMPUTER WORK BETWEEN PREGNANT AND NON-PREGNANT WOMEN (#04020)

Principal Investigator: Geneviève A. Dumas (Queen's University)

Co-Investigators: Andrew B. Leger (Queen's University); Michael McGrath (Kingston General Hospital); André Plamondon, Alain Delisle (Institut de recherche en santé et en sécurité du travail)

Sponsoring Institution: Queen's University

Two-Year Funding: \$113,661.00

This project will assess the effectiveness of a desk board designed to provide arm support during computer work on the back and the upper extremity of women in late pregnancy.

EVALUATION AND SUSTAINABILITY OF ERGONOMIC INTERVENTIONS (#04023)

Principal Investigator: Richard P. Wells (University of Waterloo)

Co-Investigators: Donald C. Cole, Emile Tompa, Desre M. Kramer (Institute for Work & Health); Syed Naqvi (Occupational Health Clinics for Ontario Workers); Mardon B. Frazer, Nancy Theberge (University of Waterloo)

Sponsoring Institution: University of Waterloo

Two-Year Funding: \$148,600.00

Earlier projects by this research team have developed a framework and measures for assessing the processes and outcomes of participatory ergonomic interventions in manufacturing plants in Ontario. This project aims to develop health and financial performance evaluation approaches for lagging indicators (effort, discomfort, work disability), and to assess the sustainability of the participatory ergonomics programs that have already been initiated.

PHYSIOLOGICAL DEMANDS OF A FIREFIGHTER CANDIDATE RECRUITMENT TEST AND RELATIONSHIP TO FIREFIGHTING (#04024)

Principal Investigator: Richard L. Hughson (University of Waterloo)

Co-Investigators: Michael T. Sharratt (University of Waterloo)

Sponsoring Institution: University of Waterloo

Two-Year Funding: \$193,256.00

This project aims to quantify the physiological demands of firefighting tasks and of a firefighter recruit testing protocol by measurement of oxygen uptake, carbon dioxide output, ventilatory patterns, and heart rate.

COMPENSATORY STEPPING IN RESPONSE TO POSTURAL PERTURBATION IN A GROUP OF WORKING-AGE, UNILATERAL, TRANSTIBIAL AMPUTEES (#04026)

Principal Investigator: Timothy V. Pauley (West Park Healthcare Centre)

Co-Investigators: Brian E. Maki (Sunnybrook and Women's College Health Sciences Centre); Michael Devlin (West Park Healthcare Centre)

Sponsoring Institution: West Park Healthcare Centre

One-Year Funding: \$18,020.00

The aim of this research is to gain a clearer understanding of the degree of impairment resulting from unilateral, transtibial amputation. The findings will help assess whether individuals with unilateral transtibial amputations can return to their previous occupations or need retraining in other areas.

SPINAL CORD INJURY: DETERMINING REHABILITATION COSTS AND EMPLOYABILITY IN NON-MEDICARE BENEFITS PROGRAMS (#04027)

Principal Investigators: Molly Verrier, Viivi Riis (University of Toronto)

Co-Investigators: Susan Jaglal (University of Toronto); Jan Walker (West Park Health Centre); Emil Tompa (Institute for Work & Health)

Sponsoring Institution: University of Toronto

One-Year Funding: \$27,892.00

The aim of this feasibility study is to develop a model of benefits (health and rehabilitation services) and outcome (employability) that will permit comparison between two funding programs — the WSIB and auto insurance benefits — for spinal column injuries. The model will be used for a future national study.

WHAT ARE THE KEY MODIFIABLE PERSONAL AND ENVIRONMENTAL FACTORS THAT PREVENT DISABILITY IN PEOPLE WITH BACK PAIN? A CONSENSUS USING THE DELPHI AND Q-CARD METHODOLOGIES (#04028)

Principal Investigator: Jaime Guzman (Institute for Work & Health)

Co-Investigators: John W. Frank (University of Toronto); Jill Hayden, Andrea Furlan, John Francis Flannery (Institute for Work & Health); J. David Cassidy (Toronto Western Hospital Research Institute); Patrick Loisel (Université de Sherbrooke)

Sponsoring Institution: Institute for Work & Health

One-Year Funding: \$29,504.00

This project aimed to reach evidence-based consensus among a panel of 24 internationally renowned researchers and Ontario stakeholders on the relative impact and modifiability of personal and environment factors affecting participation in people with back pain.

ROTATOR CUFF REPAIR FAILURES: CAUSES AND SOLUTIONS (#04031)

Principal Investigator: Guy Trudel (University of Ottawa)

Co-Investigators: Hans Unthoff (University of Ottawa); David S. Backman (Institute for Aerospace Research, National Research Council); Martin Lecompte (The Ottawa Hospital)

Sponsoring Institution: University of Ottawa

Two-Year Funding: \$280,005.00

Roughly half of rotator cuff repair surgeries fail in the months after repair. This research proceeds on the hypothesis that a massive remodelling of the tendon after surgery weakens the surgical construct. The study will conduct a series of experiments in animal models to test this hypothesis. The results should translate into recommendations to increase the success rate of rotator cuff repairs.

TOWARD REDUCING INJURIES IN LIFT TRUCKS: UNDERSTANDING EYE MOVEMENT, AND LINE-OF-SIGHT IMPAIRMENTS DUE TO POSTURAL CONSTRAINTS IMPOSED BY LIFT TRUCK OPERATION (#04032)

Principal Investigator: Sylvain G. Grenier (Laurentian University)

Co-Investigators: Tammy R. Eger (Laurentian University); Jonathan Tyson (Pulp and Paper Health and Safety Association); Lori Ann Vallis (University of Guelph)

Sponsoring Institution: Laurentian University

Two-Year Funding: \$138,600.00

Poor lines of sight often require lift truck operators to assume awkward postures to maintain visibility; these awkward postures are associated with musculoskeletal injuries. This project will gather line-of-sight data on different models of lift trucks, and then use these data in computer simulations to suggest line-of-sight improvements to lift truck design.

THE ELECTROPHYSIOLOGICAL CHARACTERIZATION OF MUSCLES AFFECTED BY REPETITIVE STRAIN INJURY (#04036)

Principal Investigator: Linda B. McLean (Queen's University)

Co-Investigators: Daniel W. Stashuk (University of Waterloo); Timothy Doherty (St. Joseph's Health Care)

Sponsoring Institution: Queen's University

Two-Year Funding: \$130,600.00

The study will apply a comprehensive and objective neurophysiological analysis to upper limbs affected by repetitive strain injury to characterize repetitive strain injury as being a myopathic condition, a neuropathic condition, neither, or both.

PREDICTORS OF THE INCIDENCE OF DISABILITY INCOME INSURANCE AMONG ONTARIO LABOUR FORCE PARTICIPANTS, 1994-2004 (#04038)

Principal Investigator: Cameron A. Mustard (Institute for Work & Health)

Sponsoring Institution: Institute for Work & Health

Two-Year Funding: \$161,000.00

This project will describe the incidence of disability income insurance received by Ontario labour force participants over the period 1994-2004, the sources of disability income insurance received by Ontario labour force participants who become disabled, and the impact of disability on the economic circumstances of households.

STEPPING INTO HEALTH: THE SEARCH FOR A MORE EFFECTIVE WORKSITE PHYSICAL ACTIVITY INTERVENTION (#05001)

Principal Investigator: Tanya R. Berry (University of Alberta)

Co-Investigators: Jill Tracey, Kemberley A. Dawson, Marilyn Jacobs, Kathryn Zettel, Stephanie Kibbee (Wilfrid Laurier University)

Sponsoring Institution: University of Alberta

One-Year Funding: \$27,872.50

The main purpose of the proposed study is to examine whether an internet-based program for promoting physical activity is as, or more, effective than a traditional worksite intervention program in relation to work absenteeism, physical activity levels, stage of behaviour change, self-efficacy, job satisfaction and job stress.

OPTIMAL INSTALLATION OF AUDITORY WARNING DEVICES TO IMPROVE SAFETY IN THE WORKPLACE (#05005)

Principal Investigator: Christian Giguère (University of Ottawa)

Co-Investigator: Chantal Laroche (University of Ottawa)

Sponsoring Institution: University of Ottawa

Two-Year Funding: \$146,863.00

The research aims to arrive at a functional solution for the common workplace problem of situation and environment appropriate identification and placement of work-related auditory warning signal devices. Knowledge gained from this research project should contribute to a more reliable protocol for assisting practitioners with the selection and placement of audible warning signals in noisy work environments.

POWERLINE MAINTAINER'S GLOVES: APPROACHES TO REDUCING HAND LOADING, IMPROVING PERFORMANCE, AND REDUCING MUSCULOSKELETAL DISORDER RISK FACTORS (#05008)

Principal Investigator: Richard P. Wells (University of Waterloo)

Co-Investigators: Mardon B. Frazer, Heather Carnahan (University of Waterloo); Shannon J. Maracle, Wendy K. Dunk (Electrical & Utilities Safety Association)

Sponsoring Institution: University of Waterloo

One-Year Funding: \$36,350.00

This project aims to assess different combinations of rubber insulating gloves and leather protective outer gloves used by workers who perform maintenance of electrical power lines. The assessment will look into the risk factors for developing musculoskeletal injuries to the upper limbs because of increased hand loading when opening and closing the hand. The expected result of this experiment is new knowledge on the effect of glove thickness, size and design on performance and perceived comfort.

MULTI-TASK JOBS AND ROTATION (#05009)

Principal Investigator: Richard P. Wells (University of Waterloo)

Co-Investigators: James Potvin, Peter Keir (McMaster University); Clark R. Dickerson, Mardon B. Frazer, Heather Carnahan (University of Waterloo); Anne E. Moore (York University)

Sponsoring Institution: University of Waterloo

One-Year Funding: \$28,695.00

Questions about job rotation are commonly asked by workplace parties. Variety in jobs is generally considered to aid in the prevention of musculoskeletal disorders (MSD). The project's objectives are to develop a method to test whether task variation provided benefits and to use the approach in three different body regions.

MINE RESCUE CONTROL GROUP TRAINING (#05020)

Principal Investigator: Paul G. Dunn (Laurentian University)

Co-Investigators: Tammy R. Eger (Laurentian University); Alex Gryska (Mines and Aggregates Safety and Health Association)

Sponsoring Institution: Laurentian University

Two-Year Funding: \$236,551.68

The objective of this proposal is to use virtual reality technique as support in mine evacuation situations. The plan devised into two areas: (1) to develop a process to bring in mine data into

a VR model and to create automatically the information required by mine rescue control groups, and (2) to define the communication needed between rescue teams and mine rescue control groups. There will be several outcomes including automated generation of VR models from mine 3-D models, and automated incorporation of smoke transport as a result of the actual mine ventilation network.

OCCUPATIONAL EXPOSURES OF SIX DEGREE-OF-FREEDOM (MULTI-AXIS) WHOLE-BODY VIBRATION: RELATIONSHIP BETWEEN EXPOSURES AND COMFORT (#05025)

Principal Investigator: James P. Dickey (University of Guelph)

Co-Investigators: Tammy R. Eger (Laurentian University); Sylvain G. Grenier (Laurentian University/Occupational Health Clinics for Ontario Workers); Michele L. Oliver (University of Guelph); Paul-Émile Boileau (Institut de recherche Robert Sauvé en santé et en sécurité du travail); Alan Salmoni (University of Western Ontario); Peter Vi (Construction Safety Association of Ontario)

Sponsoring Institution: University of Guelph

Two-Year Funding: \$253,930.00

This project will evaluate the relationship between multi-axial whole body vibration (WBV), seating design, and operator comfort. Workplace exposure to WBV poses a significant health problem. Many studies evaluated the effects of single-axis vibration, but none have addressed the interaction of vibrations in several degrees of freedom simultaneously.

VALIDATION OF A NEW STRATEGY TO ACQUIRE ON-LINE PEAK AND CUMULATIVE LOADING FOR MANUAL HANDLING TASKS IN INDUSTRIAL SETTINGS (#05027)

Principal Investigator: Joan M. Stevenson (Queen's University)

Co-Investigators: Nicholas Troje, Evelyn L. Morin, J. Timothy Bryant (Queen's University); Tammy R. Eger (Laurentian University)

Sponsoring Institution: Queen's University

Two-Year Funding: \$272,320.00

In this proposal the authors seek funding to develop and validate a portable system for data acquisition using recent developments in inertial motion sensor technology.

MANAGING THE 'TAIL OF THE CURVE': THE COURSE, PREDICTIVE FACTORS, AND WORK-RELATED OUTCOMES OF INJURED WORKERS ONE YEAR AFTER ATTENDING THE WSIB SPECIALTY CLINICS FOR UPPER LIMB DISORDERS (#05028)

Principal Investigator: Dorcas E. Beaton (St. Michael's Hospital)

Co-Investigators: Joy C. MacDermid (McMaster University); Robin Richards (Sunnybrook & Women's College Health Sciences Centre); Renée-Louise Franche, Pierre Côté, Sheila Hogg-Johnson, Claire Bombardier (Institute for Work & Health); Sonia Pagura (Orthopaedic & Arthritic Institute)

Sponsoring Institution: St. Michael's Hospital

Two-Year Funding: \$287,332.92

The complexity of the injuries of persons with longer term soft tissue disorders, together with their work situation, make them a challenge for WSIB specialty clinics. Although the clinics assess and use principles of best practice to make recommendations for these workers, the health care team in large part does not know what happens to these workers after they leave the clinic, or what the predictors of post-clinic courses are. This project will use a prospective cohort study at two WSIB specialty clinics to find out about these outcomes.

DEVELOPMENT OF PERMEATION PASSIVE SAMPLERS FOR OCCUPATIONAL EXPOSURE MONITORING OF COMPLEX MIXTURES OF VOLATILE ORGANIC COMPOUNDS (#05029)

Principal Investigator: Tadeusz Górecki (University of Waterloo)

Sponsoring Institution: University of Waterloo

One-Year Funding: \$29,843.00

This project seeks to develop a permeation sampling device for organic vapours and to evaluate its performance in laboratory and field settings. The samplers will be evaluated in a field setting with exposure to complex mixtures of organic vapours.

**RADIATION EXPOSURE AND RISK OF CANCER AMONG ONTARIO URANIUM MINERS:
A CASE-COHORT STUDY (#05034)**

Principal Investigator: Loraine D. Marrett (Cancer Care Ontario)

Co-Investigators: Jennifer Payne (Cancer Care Ontario); John McLaughlin (Samuel Lunenfeld Research Institute)

Sponsoring Institution: Cancer Care Ontario

Two-Year Funding: \$46,423.00

This project aims to assess the association between alpha particle and gamma radiation exposure and cancer incidence and mortality in uranium miners employed in Ontario from 1954. Individual exposures will be ascertained by combining data from the Mining Master File and the National Dose Registry for the period 1968 to the present.

**REVIEW OF TRENDS IN WORK-RELATED ASTHMA CLAIMS AND POSSIBLE ROLE OF
MEDICAL SURVEILLANCE (#05035)**

Principal Investigators: Susan M. Tarlo, Gary M. Liss (University of Toronto)

Co-Investigators: Carol Luce (Workplace Safety & Insurance Board)

Sponsoring Institution: University of Toronto

Two-Year Funding: \$143,014.00

This proposal has three main aims: (1) to determine whether the previously observed decline in accepted claims for occupational asthma due to diisocyanate exposures (subject to a mandated surveillance program) has continued, with a comparison to claims for occupational asthma due to other exposures (with no mandated surveillance); (2) to determine if there are differences in severity, duration, and treatment between these two groups of occupational asthma; and (3) to describe the characteristics of work-aggravated asthma, in terms of the demographics of the cases, disease severity, and causal exposures.

**AN ETHNOGRAPHIC STUDY OF INJURED WORKERS' COMPLEX CLAIMS EXPERIENCES
(#05037)**

Principal Investigator: Ellen MacEachen (Institute for Work & Health)

Co-Investigators: Sue Ferrier, Donald C. Cole (Institute for Work & Health)

Sponsoring Institution: Institute for Work & Health

Two-Year Funding: \$97,671.00

The objective of this study is to gain a better understanding of some systematic, process-related characteristics of costly claims by studying injured worker experiences of having a complex claim.

**EVALUATION OF AN HSA-INITIATED COLLABORATIVE PARTNERSHIP TO IMPLEMENT
PARTICIPATORY ERGONOMIC PROGRAMS (#05040)**

Principal Investigator: Philip L. Bigelow (Institute for Work & Health)

Co-Investigators: Donald C. Cole, Sue Ferrier, Renée-Louise Franche, Dov Zohar (Institute for Work & Health); Mardon B. Frazer, Desre M. Kramer, Nancy Theberge, Richard P. Wells (University of Waterloo); Wendy Lee, Shannon J. Maracle (Electrical & Utilities Safety Association)

Sponsoring Institution: Institute for Work & Health

Two-Year Funding: \$292,908.00

This proposal builds on previous research by several of the co-investigators dealing with an ergonomic intervention evaluation. The purpose of the research is to develop successful strategies for implementing participatory ergonomic programs in companies by understanding the barriers and the facilitators to successful implementation.

RETURN TO WORK AND BEST PRACTICES IN UNIONIZED WORKPLACES: JOINT COMMITTEES AND ADDRESSING WORKER HEALTH AND SAFETY NEEDS (#05042)

Principal Investigator: Paul L. Gallina (Bishop's University)

Co-Investigators: Michel Lacerte (University of Western Ontario); Sara Slinn (Queen's University)

Sponsoring Institution: Bishop's University

One-Year Funding: \$28,500.00

The purpose of this study is to understand the return to work process among unionized workplaces in Ontario. The objective is to document what is in vogue in this area and to explore the extent to which best practices in return to work are implemented with a view toward suggesting improvements where needed. The study will also look at the use of joint committees in facilitating return to work.

NUMERICAL MODEL DEVELOPMENT OF A HEAVY MINING VEHICLE MULTIPIECE RIM AND WHEEL ASSEMBLY FOR STRUCTURAL ANALYSIS (#05102)

Principal Investigator: William J. Altenhof (University of Windsor)

Sponsoring Institution: University of Windsor

One-Year Funding: \$30,000.00

This project will incorporate experimental and numerical research efforts to better understand the mechanical response of a heavy mining vehicle's multipiece rim/wheel assembly when subjected to operating and laboratory controlled loading conditions. The main objective of this project is to develop an engineering tool to understand the current structural capabilities of multipiece rim/wheel assemblies and to help develop future heavy mining rim/wheel assemblies such that their structural capabilities greatly reduce the possibility of explosion and result in safer conditions for operation and maintenance.

DEVELOPMENT OF PRODUCTS TO TRANSFER LINE OF SIGHT AND MOBILE EQUIPMENT KNOWLEDGE TO INDUSTRY AND EDUCATIONAL INSTITUTIONS (#05106)

Principal Investigator: Ann L. Pegoraro (Laurentian University)

Co-Investigators: Paul G. Dunn, Tammy R. Eger, Sylvain G. Grenier, Michel Larivière (Laurentian University); Shawn Allenby (Ottawa-Carleton District School Board); Yi Huang (Northern College); Rick Banting (Mines and Aggregates Safety and Health Association)

Sponsoring Institution: Laurentian University

One-Year Funding: \$40,000.00

This project aims to translate the findings of RAC-funded research on line of sight and visibility in underground mines into practical applications, such as a computer-based line-of-sight training game for operators of underground load-haul-dump vehicles, on-line educational modules, a line-of-sight and mobile equipment audit, and a users' manual explaining how to evaluate line of sight. The tools developed will serve to educate current workers and increase the profile of workplace safety among younger workers.

DEVELOPMENT OF A MOVER'S PACK: A SPECIALIZED BACKPACK FOR THE MOVING INDUSTRY (#05107)

Principal Investigator: Joan M. Stevenson (Queen's University)

Co-Investigators: Bill Ostrom (Ostrom Outdoors Ltd); J. Timothy Bryant (Queen's University)

Sponsoring Institution: Queen's University

One-Year Funding: \$40,000.00

This project will design and evaluate a new Mover's Pack for workers in the moving industry. Currently, movers use their hands to pick up, carry, and place loads when performing single-person lifts. Because the path between truck and building is often tortuous and objects are either heavy or awkward, there is an ever-present danger of slipping or wrenching one's back. The project will integrate movers into the design process and will develop a prototype mover's pack that will allow workers to carry the loads on their back.

GUIDELINES FOR THE DEVELOPMENT OF RE-ENTRY PROTOCOLS IN SEISMICALLY ACTIVE MINES (#05108)

Principal Investigator: Stephen D. McKinnon (Queen's University)

Sponsoring Institution: Queen's University

One-Year Funding: \$58,900.00

The unpredictability of seismic events in deep mines makes management of their effects difficult. Following large seismic events, access to affected areas is normally restricted for a period of time. The objective of this project is to produce practical guidelines for the development of re-entry protocols into seismically active mines. The guidelines will be based on an analysis of currently used re-entry protocols together with their mine-specific details such as depth, rock type and properties, mining method, and site geology.

SIMULTANEOUS EXPOSURE MEASUREMENT OF NOISE, HAND-ARM VIBRATION, AND MUSCULOSKELETAL LOADS IN BOILERMAKERS (#05111)

Principal Investigator: Alan W. Salmoni (University of Western Ontario)

Co-Investigators: Philip L. Bigelow (Institute for Work & Health); Peter Vi, Dru Sahai (Construction Safety Association of Ontario)

Sponsoring Institution: University of Western Ontario

One-Year Funding: \$60,000.00

Boilermakers are often exposed to high noise, vibration levels, and musculoskeletal loads. This can result in noise-induced hearing loss, hand-arm vibration syndrome, and musculoskeletal disorders. The main objective of this project is to help employers, unions, and industry understand the types and intensity of noise, vibration, and musculoskeletal hazards on construction sites where boilermakers work. Information gathered from the study will help workers and employers identify high-risk activities on construction sites so they can target specific tasks and tools for control and prevention.

EVALUATION OF THE IMPACT OF A PARTICIPATORY ERGONOMICS INTERVENTION IN A MEDIUM SIZE FACILITY (#05114)

Principal Investigator: David Mijatovic (Occupational Health Clinics for Ontario Workers)

Co-Investigators: Richard P. Wells (University of Waterloo); Donald C. Cole (Institute for Work & Health); Syed Naqvi (Occupational Health Clinics for Ontario Workers)

Sponsoring Institution: Occupational Health Clinics for Ontario Workers

One-Year Funding: \$36,650.00

This project will monitor the effect of establishing a participative ergonomics change team within a medium sized auto parts manufacturing facility. The research team will monitor activities, document the workplace's response, track implementation, and assess effectiveness. Information gathered through the process will be used to help convert the relevant background research on participative ergonomics into a practical guide, in the form of a handbook, on establishing of participative ergonomic change teams in the auto parts sector in general.

IDENTIFYING THE BARRIERS AND FACILITATORS TO THE ADOPTION OF ERGONOMIC INNOVATIONS IN THE CONSTRUCTION SECTOR (#05115)

Principal Investigator: Philip L. Bigelow (Institute for Work & Health);

Co-Investigators: Desre M. Kramer, Richard P. Wells (University of Waterloo); Enzo Garritano, Peter Vi (Construction Safety Association of Ontario)

Sponsoring Institution: Institute for Work & Health

One-Year Funding: \$59,777.00

This study will use a 'diffusion of innovations' framework to explore the adoption of ergonomic innovations in the construction sector. A small number of opinion leaders in the construction sector will be given an innovation—a hydraulically operated, aluminum drop-down ladder rack—and their use of the innovation in the field is expected to influence others to use it as well. The resulting expected diffusion of the innovation throughout the field will then be studied to uncover the barriers and facilitators of diffusion.

DEVELOPING STANDARDIZED METRICS FOR WORK DISABILITY MANAGEMENT BENCHMARKING (#05116)

Principal Investigator: Donald C. Cole (Institute for Work & Health)

Co-Investigators: Liz Scott (Organizational Solutions); Andrew Clarke (Clarke, Brown & Associates); Sheilah Hogg-Johnson (Institute for Work & Health)

Sponsoring Institution: Institute for Work & Health

One-Year Funding: \$59,932.00

Lack of standardization of measures and inconsistencies across work disability management data systems pose challenges for workplace parties, insurers, and researchers trying to estimate the total burden of work disability and improve work disability management practices. The project will establish a benchmarking collaborative that would standardize recording and reporting of work disability management metrics in ways that meet the needs of workplaces, their organizations, and researchers.

MUSCULOSKELETAL INJURY PREVENTION FOR SIGN LANGUAGE INTERPRETERS (#05123)

Principal Investigator: Kathryn L. Woodcock (Ryerson University)

Sponsoring Institution: Ryerson University

One-Year Funding: \$29,370.00

Musculoskeletal injuries have been recognized as an occupational hazard of sign language interpreting. The work involves repetitive movement of the hands, arms, shoulders, head, face, and—when interpreting from sign language to spoken language—voice. Both directions of interpretation impose considerable mental workload to manage the language flowing between the communicators. This project will compile up-to-date information on musculoskeletal injury prevention relevant to sign interpreting in multimedia form combining printed reference material and online video illustration.

PILOT STUDY OF MANGANESE ACCUMULATION IN ONTARIO WELDERS (#05124)

Principal Investigator: Ana Pejović-Milić (Ryerson University)

Co-Investigators: David Chettle, Ted Haines (McMaster University); John Oudyk, Michael Pysklywec (Occupational Health Clinics for Ontario Workers); Harry Roels (Université catholique de Louvain)

Sponsoring Institution: Ryerson University

One-Year Funding: \$59,831.00

Excessive, prolonged exposure to manganese is known to be neurotoxic and has resulted in cases of occupational manganism, a Parkinson's disease-like syndrome, in some jurisdictions outside Ontario. Exposure to manganese at low levels for a prolonged period of time can result in milder neurological symptoms, including memory deficit, loss of motor control, and reduction in the refinement of certain bodily motions. This project will use a novel diagnostic tool—*in vivo* neutron activation analysis—to test whether the bone manganese levels in humans can be reliably measured with the tool; whether the tool can distinguish between exposed and non-exposed subjects; and whether bone manganese levels do reflect differences in long-term occupational exposure.

EVALUATING 'MENTAL HEALTH WORKS': A FEASIBILITY STUDY (#05125)

Principal Investigator: Bernadette Stringer (McMaster University)

Co-Investigators: Ted Haines, Andrea Baumann, Ron Goeree, Nick Kates, Wayne Lewchuk, Harriett MacMillan, Harry S. Shannon (McMaster University); Victor Catano, Mark Fleming, Lori Francis (St. Mary's University); Bonnie Kirsh (University of Toronto); Terry Krupa (Queen's University); Donna Lero (University of Guelph); Chantal Viens (Université Laval); Martin Shain (Centre for Addiction and Mental Health)

Sponsoring Institution: McMaster University

One-Year Funding: \$30,000.00

This preliminary study will explore the feasibility of a larger-scale study on the effectiveness of educational and behavioural mental health interventions.

EXPOSURE LIMITS FOR WORK PERFORMED IN DEEP MECHANIZED MINES (#06005)

Principal Investigator: Glen P. Kenny (University of Ottawa)

Co-Investigators: Ollie Jay (University of Ottawa); Stephen Hardcastle (Resources Canada)

Sponsoring Institution: University of Ottawa

Two-Year Funding: \$195,024.00

The incentive to mine deeper creates new challenges for the mining industry and increases the risk of exposing workers to adverse and hot working conditions. Exposure to a hot environment can elicit a significant physiological strain potentially presenting a substantial health risk to the individual. Currently, mining work standards for environmental temperature are based more on the quality of the physical environmental conditions than they are on the effect of those conditions on the individual miner. These standards have inherent limitations in their ability to predict maximum allowable exposure durations. This study will research, establish and validate a thermal stress index that is appropriate and relevant to assessing thermal stress in miners working in Canada's deep mechanized mines.

THE ETIOLOGY AND REDUCTION OF ROLE OVERHEAD (#06007)

Principal Investigator: Linda E. Duxbury (Carleton University)

Co-Investigators: Christopher Higgins (University of Western Ontario); Sean Lyons (St. Francis Xavier University)

Sponsoring Institution: Carleton University

Two-Year Funding: \$82,700.00

The proportion of women, dual-income families and employed Canadians with childcare, eldercare or sandwich (childcare and eldercare) responsibilities have increased dramatically over the past several decades. Technologies such as e-mail, cellular telephones and laptop computers have made it possible for employees to work any time, anywhere. In this context of increasing time pressures on workers, record numbers of Canadian workers are suffering from role overload — i.e., they do not have the time and energy to meet all of the competing demands of their work and family lives. Recent Canadian research indicates that overload is taking an increasing toll on workers, employers and the Canadian health care system. This study will focus on the phenomenon of role overload, its causes, and its consequences, and the actions workers, employers, and families can take to reduce it.

EXPLORING THE ROLE AND STRATEGIES FOR KNOWLEDGE EXCHANGE AND TRANSLATION BY INJURED WORKER GROUPS (#06008)

Principal Investigator: Lynn E. Shaw (University of Western Ontario)

Co-Investigators: Joy C. MacDermid (McMaster University); Anita Kothari (University of Western Ontario); Andrea Duncan (Workplace Safety & Insurance Board)

Sponsoring Institution: University of Western Ontario

One-Year Funding: \$26,504.60

Injured workers need practical information from health care providers, insurers and employers to make decisions about their recovery, rehabilitation and participation in return-to-work processes. Many injured workers have experienced confusion, suspicion, and gaps in the information they receive, and often search for information from sources such as the Internet, unions, worker representatives, or injured worker groups (IWG's). IWG's will lead this project in collaboration with other organizations, researchers, and clinicians to examine the role of IWG's in interpreting and communicating information and research findings to injured workers.

HUMAN FACTORS AND ENGINEERING DESIGN TOOL USE AMONG PROFESSIONAL ERGONOMISTS AND ENGINEERS (#06011)

Principal Investigator: W. Patrick Neumann (Ryerson University)

Co-Investigators: Richard P. Wells, Nancy Theberge (University of Waterloo); Saeed Zolfaghario (Ryerson University); Jonas Laring (Swedish National Institute for Working Life)

Sponsoring Institution: Ryerson University

Three-Year Funding: \$209,497.00

'If you can't measure it, you can't manage it,' goes the business school maxim, but how does this apply to human factors in Ontario workplaces? While many ergonomics assessment tools have been developed, the problem of work-related disorders persists. Are the tools not being used? Or do they not meet the needs of workplace designers? This project intends to explore

these issues by interviewing professional ergonomists and engineers in Ontario and, through a cooperation with the Swedish National Institute for Working Life, in Sweden.

DEVELOPING FACILITATION FOR PRIMARY OCCUPATIONAL HEALTH CARE (#06014)

Principal Investigator: Grant Russell (University of Ottawa)

Co-Investigators: William E. Hogg (C. T. Lamont Centre); Jacques Lemelin (University of Ottawa)

Sponsoring Institution: University of Ottawa

One-Year Funding: \$29,974.00

This project aims to develop a new strategy for improving the care of those who have become injured or ill because of their work. Central to this model is an external facilitator, a health professional with expertise in occupational health and primary health care. The use of a facilitator in family physicians' offices to foster and support change is not new; what is new is using an external facilitator to improve the delivery and coordination of occupational health care. This study will develop the facilitation tools to do just that, while remaining aware of the needs of the injured/ill workers, WSIB, employers, and primary health care professionals.

ERGONOMICS IN THE TRANSPORTATION SECTOR: THE DEVELOPMENT OF BEST PRACTICES IN MSD-REDUCTION STRATEGIES (#06019)

Principal Investigator: Richard P. Wells (University of Waterloo)

Co-Investigators: Mark J. Diacur (Transportation Health and Safety Association of Ontario); Desre M. Kramer (University of Waterloo); Philip L. Bigelow (Institute for Work & Health)

Sponsoring Institution: University of Waterloo

Two-Year Funding: \$307,465.00

This study will set the stage for a transportation sector-specific response to the need to prevent MSDs. This research, conducted in collaboration with the transportation health and safety association, will be developing best practices for the prevention of MSDs. A best-practices document on the prevention of MSDs in transportation will emerge from the experience of the workplace parties coupled with evidence-based knowledge in the field.

RECURRENCE AND PERSISTENCE OF WORK ABSENCE: UNDERSTANDING THEIR RISK FACTORS AND LONG-TERM IMPACT ON WORKERS' HEALTH, WORK LIMITATIONS, AND NON-WORK ROLE PARTICIPATION (#06021)

Principal Investigator: Renée-Louise Franche (Institute for Work & Health)

Co-Investigators: F. Curtis Breslin, Pierre Côté, John W. Frank, Gail Hepburn, Sheilah Hogg-Johnson, Cameron A. Mustard, Rhoda Reardon (Institute for Work & Health)

Sponsoring Institution: Institute for Work & Health

Two-Year Funding: \$246,674.00

This study will concentrate on understanding what characteristics of the workplace, insurer, healthcare provider, and worker can be modified to ensure the long-term success of return to work (RTW). The RTW experiences of a group of workers with musculoskeletal injuries will be studied over the course of 24 months. The study will also examine the long-term impact of workplace injuries on their health, quality of work life, and participation in parenting and care-giving roles. By identifying which characteristics can be changed to improve RTW success and reduce absenteeism, this research will provide important guidance for future policy, programs, and interventions for RTW.

A PILOT STUDY TOWARDS A VIRTUAL WORKSPACE DESIGN TOOL FOR ERGONOMIC ASSESSMENT OF VISION AND ARM FUNCTION (#06025)

Principal Investigator: Farrokh Janabi-Sharifi (Ryerson University)

Co-Investigators: W. Patrick Neumann (Ryerson University); Anne E. Moore (York University)

Sponsoring Institution: Ryerson University

One-Year Funding: \$29,985.00

Repetitive strain disorders of the hand and arm are a serious problem for Ontario workers and employers. Unfortunately it is not currently possible for workplace designers and engineers to predict what kind of physical load might result when they design a new workstation. The project aims to develop a novel design tool that can help engineers position parts and compo-

nents where operators can easily see them, can easily handle them, and can install them with minimal risk of injury. By creating a computer model of how people see and reach to grasp objects it is possible to simulate and analyze the workers' ergonomic situation—before they are exposed to harmful repetitive work.

AN EXAMINATION OF THE WORKING CONDITIONS AND RISK FACTORS FOR WORK-RELATED INJURIES AMONG IMMIGRANT WORKERS IN ONTARIO (#06026)

Principal Investigator: Peter M. Smith (Institute for Work & Health)

Co-Investigators: Cameron A. Mustard (Institute for Work & Health)

Sponsoring Institution: Institute for Work & Health

Two-Year Funding: \$101,700.00

Immigrants to Canada make up an increasing segment of the labour force. The aim of this study is to determine whether different cultural backgrounds, fewer social networks, and lower proficiency in the two official Canadian languages expose immigrant workers to workplace factors that place them at higher risk for different types of work-related injuries.

THE PREVALENCE OF CHRONIC BERYLLIUM DISEASE AMONG SARCOIDOSIS PATIENTS IN ONTARIO (#06030)

Principal Investigators: Susan M. Tarlo, Gary M. Liss (St. Michael's Hospital)

Co-Investigators: Ahmed M. Al-Musaed, Meyer Balter (University of Toronto), Bruce Mazer (McGill University); Victor Hoffstein (St. Michael's Hospital)

Sponsoring Institution: St. Michael's Hospital

Two-Year Funding: \$147,866.80

Chronic beryllium disease is a serious chronic occupational lung disease that may be indistinguishable clinically and on x-ray from sarcoidosis, which is a relatively common respiratory condition of unknown cause. Data from international studies indicate that approximately six percent of individuals diagnosed with pulmonary sarcoidosis in fact had chronic beryllium disease. No similar studies have been done in a Canadian population. This investigation will determine the prevalence of (unrecognized) beryllium disease among patients in Ontario diagnosed with sarcoidosis.

KEY EXPOSURES CAUSING WORK-RELATED ALLERGIC CONTACT DERMATITIS AND EVIDENCE FOR DUAL CAUSATION OF OCCUPATIONAL ASTHMA (#06031)

Principal Investigators: D. Linn Holness, Gary M. Liss (St. Michael's Hospital)

Co-Investigators: Susan M. Tarlo, Irena Kudla (St. Michael's Hospital); Melanie Pratt (University of Ottawa); Denis Sasseville (McGill University)

Sponsoring Institution: St. Michael's Hospital

Two-Year Funding: \$109,342.00

Occupational contact dermatitis and occupational asthma are common occupational diseases that are under-recognized and under-reported. One workplace chemical may cause both occupational allergic contact dermatitis and occupational allergic asthma. Furthermore, the sensitization can occur through either inhalation or skin exposure. Because skin and lung specialists tend to practice in their specialty silos, the possible linkages between the routes of exposure and responses of the lung and skin may be overlooked. This study will identify the common occupational contact allergens from a current large standardized database of the North American Contact Dermatitis Group; determine the occupations and industries of those affected; and examine the evidence that these agents cause occupational asthma. It will also explore how such information could be made more useful to workplace parties and policy makers for use in prevention activities.

PROSTATE CANCER AND OCCUPATIONAL WHOLE-BODY VIBRATION EXPOSURE (#06032)

Principal Investigator: James T. Purdham (University of Toronto)

Co-Investigators: Alan W. Salmoni (University of Western Ontario); Nancy Kreiger (Cancer Care Ontario); Andrea M. Sass-Kortsak (University of Toronto); Marie-Elise Parent (Université du Québec); Jack Semiatycki (Université de Montréal)

Sponsoring Institution: University of Toronto

Two-Year Funding: \$140,480.00

Prostate cancer is the most common cancer among Canadian men and the second most common cancer in men worldwide. Our understanding of the risk factors for prostate cancer remains limited. However, age, family history, and ethnic origin have been consistently identified as major risk factors for the disease. Many studies have looked at occupational exposures to chemical and physical agents as possible risk factors for the disease, but the findings, while often positive, have not been consistently so. Whole-body vibration (WBV) occurs when energy is transmitted to the body from vibrating surfaces, either through the feet, if standing on the vibrating surface or, importantly from the point of view of this study, through the trunk if seated. No study has yet looked at WBV as a possible risk factor, even though four to seven percent of the population is exposed to WBV in the workplace, and exposure to WBV accounts for a significant number of other health problems. The present study will use data collected from a previous study in Montreal to assess the risk of prostate cancer for men who work in WBV exposed occupations.

BIOPHYSICAL CHARACTERISTICS OF INFLUENZA BIOAEROSOLS IN HEALTH CARE INSTITUTIONS (#06033)

Principal Investigator: James A. Scott (University of Toronto)

Co-Investigators: Andrea M. Sass-Kortsak (University of Toronto); Sigmund Krajden (St. Joseph's Health Centre); Allison McGeer (Mt. Sinai Hospital); D. Linn Holness (University of Toronto); Gabor Lantos (Occupational Health Management Services Inc.); Mel Krajden (British Columbia Centre for Disease Control)

Sponsoring Institution: University of Toronto

Three-Year Funding: \$390,949.00

This project will use size selective air sampling, surface sampling, and the sampling of used respiratory personal protective equipment to determine the presence, concentration and size distribution of infectious particles of virus during seasonal influenza in hospitals and long-term care facilities.

DEVELOPING A TOOL FOR ENGINEERING DESIGN THAT WILL PREDICT THE EFFORT REQUIRED BY THE HAND AND WRIST DURING MANUAL WORK (#06104)

Principal Investigator: Richard P. Wells (University of Waterloo)

Co-Investigators: Desre M. Kramer, Clark Dickerson (University of Waterloo); Wyatt Clark (Canadian Auto Workers); Carolin Bart (DaimlerChrysler)

Sponsoring Institution: University of Waterloo

One-Year Funding: \$39,928.00

The design of a car is a complex process, typically involving over a thousand parts per car. Assembly requires hundreds of individual tasks performed by workers. This research study will work with the design team to help them incorporate the hand strength required by workers to perform these tasks into design. The goal is to develop a tool for the design team that, once piloted and validated, could be used for multiple design processes involving manual work. The tool will provide engineers with information on the strength of the hand and forearm required in a particular situation that will feed into their design activities and requirements, ultimately minimizing the demands on workers on the line.

ASSESSMENT TOOLS FOR NON-FIXED WORK (#06106)

Principal Investigator: Anne E. Moore (York University)

Co-Investigators: Peter Vi, Enzo Garritano (Construction Safety Association of Ontario); Richard Wells (University of Waterloo)

Sponsoring Institution: York University

One-Year Funding: \$54,063.00

The goal of this study is to evaluate a range of ergonomic assessment tools for use in non-fixed work based, using electromyography and ratings of perceived discomfort to discriminate tasks. This study will be the first step in developing and evaluating an effective assessment protocol for non-fixed work.

HAND AND UPPER EXTREMITY FUNCTION IN WORKERS WITH OCCUPATIONAL CONTACT DERMATITIS (#06107)

Principal Investigator: Sharon L. Switzer-McIntyre (University of Toronto)

Co-Investigators: D. Linn Holness, Dorcas E. Beaton (St. Michael's Hospital); Rosemary Nixon (Occupational Dermatology Research Education Centre)

Sponsoring Institution: University of Toronto

One-Year Funding: \$ \$59,700.00

This project will act as the foundation to create a clear description of the nature and severity of the functional issues of the hand and upper extremity faced by workers suffering from contact dermatitis of the hand as well as to cultivate a core set of assessment variables required to develop a more comprehensive assessment process.

WHY IS OCCUPATIONAL DISEASE UNDER-REPORTED? (#06108)

Principal Investigators: Ronald A. House (St. Michael's Hospital); Joan Eakin (University of Toronto)

Co-Investigators: D. Linn Holness (St. Michael's Hospital)

Sponsoring Institution: St. Michael's Hospital

One-Year Funding: \$29,995.00

Guided by a multi-stakeholder steering committee and using focus group methodology, this study will identify reasons for the under-reporting of occupational disease and probe ways to overcome these barriers. The knowledge gained will be used in the development of a full grant proposal that will test the identified barriers in a larger context and propose ways to overcome the barriers.

ECONOMIC PERSPECTIVES ON WORKPLACE IN A RETURN TO WORK PROGRAM (#06109)

Principal Investigator: Helen Yaohua He (University Health Network)

Co-Investigators: J. David Cassidy, Eleanor W.G. Boyle, Sylvia Boddener (University Health Network); Emile Tompa, Sheilah Hogg-Johnson (Institute for Work & Health); Michel Schofield (Workplace Safety & Insurance Board)

Sponsoring Institution: University Health Network

One-Year Funding: \$29,914.00

Economic evaluations of return-to-work programs to date have been conducted primarily from the insurer's perspective, due to lack of data from other cost perspectives (e.g., the employer, the injured worker, society, etc.). This project undertakes preliminary empirical work needed to develop economic evaluations of these programs from the employer's perspective.

WHAT WORKPLACE CHARACTERISTICS HAVE AN IMPACT ON AN INJURED WORKER'S RETURN TO WORK? A QUALITATIVE STUDY (#06110)

Principal Investigator: Eleanor W.G. Boyle (University Health Network)

Co-Investigators: Ivan Steenstra (Institute for Work & Health); Jill Hayden, J. David Cassidy, Stephanie Wyeld (University Health Network); Richard P. Wells (University of Waterloo)

Sponsoring Institution: University Health Network

One-Year Funding: \$29,966.00

The objective of this study is to determine the workplace and organizational factors that may have an influence in the return to work process. Focus groups with supervisors, union repre-

sentatives, injured workers, return-to-work coordinators, WSIB ergonomists and WSIB mediators will be conducted to collect their opinions on these workplace factors.

SAFETY CLIMATE MONITORING IN ONTARIO (#06111)

Principal Investigator: Philip L. Bigelow (Institute for Work & Health)

Co-Investigators: Dov Zohar (Israel Institute of Technology); Monika Sharma (Industrial Accident Prevention Association); Lynda Robson, Sheilah Hogg-Johnson (Institute for Work & Health); Terrance Evers (Statistics Canada); Peter Shermer (Workplace Safety & Insurance Board)

Sponsoring Institution: Institute for Work & Health

One-Year Funding: \$22,481.00

Routine monitoring of safety climate has the potential to lead to sustainable improvements in occupational health and safety performance. This project will bring together leading researchers in the field with workplace partners. It is the first stage of a planned research program to advance theoretical and practical aspects of safety climate monitoring and interventions that impact safety climate.

PREVENTION SYSTEM OHS MANAGEMENT AUDIT TOOLS: DESCRIPTION, CONTENT VALIDATION, AND AN ASSESSMENT OF THE FEASIBILITY OF MEASUREMENT RESEARCH (#06112)

Principal Investigator: Lynda Robson (Institute for Work & Health)

Co-Investigators: Philip L. Bigelow, Dwayne Van Eerd, Garry Gray (Institute for Work & Health)

Sponsoring Institution: Institute for Work & Health

One-Year Funding: \$59,894.00

This project will describe and compare the OHS management system audit methods used by the Ontario prevention system; it will investigate the content validity of the audit instruments; and it will assess the feasibility of a larger study of the measurement properties of the instruments. Information will be gathered about the audit methods used by the prevention system organizations through interviews, document review, and participant observation.

DESIGN GUIDELINES FOR DYNAMIC BEHAVIOUR OF GROUND SUPPORT TENDONS (#06116)

Principal Investigator: Chantal Doucet (Natural Resources Canada—CANMET)

Sponsoring Institution: Natural Resources Canada—CANMET

One-Year Funding: \$39,298.00

Most underground excavations require ground support to maintain stability and ensure the safety of personnel and equipment. New support elements have appeared on the market and some testing has been carried out to quantify their dynamic capabilities and factors affecting their performance. However, this information is not currently available in simple, clear, easily-accessible format, nor have gaps and future testing needs been identified. The objectives of this project are (1) to produce data sheets for each support element that would lead to technical guidelines, and (2) to identify gaps in existing knowledge. These gaps will then be used to target future research and testing to further enhance the quality of support being installed in Ontario mines.

MORTALITY BY OCCUPATION IN CANADA: A TEN-YEAR FOLLOW-UP OF A 15% SAMPLE OF THE 1991 CENSUS (#07004)

Principal Investigator: Cameron A. Mustard (Institute for Work & Health)

Co-Investigators: Kristan J. Aronson (Queen's University); Ben Amick III (Institute for Work & Health)

Sponsoring Institution: Institute for Work & Health

Two-Year Funding: \$224,300.00

This study will describe all-cause and cause-specific mortality in relation to occupation and other measures of socio-economic status. The study will be based on the Canadian Cohort Mortality File (CCMF), currently in development, which is a population-based, longitudinal research database created by linkage of a 15% sample of 1991 census records for persons age 25 or older (the cohort data) to death registrations for the years 1991 through 2001 (the

mortality data). The research database consists of approximately 3.6 million persons, with about 36 million person-years of follow-up, and roughly 265,000 deaths expected over the 10-year period. The results of this work will identify targets for the primary and secondary prevention of work-related mortality risks and will support international comparisons of the distribution of mortality in Canada by socioeconomic status.

OCCUPATIONAL AND OTHER FACTORS AS DETERMINANTS OF MELATONIN LEVELS AMONG ROTATING SHIFT NURSES (#07005)

Principal Investigator: Kristan J. Aronson (Queen's University)

Co-Investigators: Joan Tranmer, Charles Graham, Harriet Richardson (Queen's University)

Sponsoring Institution: Queen's University

Three-Year Funding: \$447,769.17

The purpose of this research is to determine the relationships between occupational exposure to light, light while sleeping, physical activity, and other potential determinants of melatonin among working nurses. The project will study 150 healthy female rotating shift nurses age 40-65 working at Kingston General Hospital, initially with 75 working night shifts and 75 age-frequency-matched nurses working day shifts. Each of four data collection periods over different shifts (day and night) and seasons (summer and winter) will be 48-hours long, with data collected through a diary recording occupational physical activity and other factors, while light meters record ambient light, and measurements of melatonin are obtained from urine and saliva. Once it is determined precisely which occupational and other factors affect melatonin, and at exactly at what levels, timing and duration, this knowledge can be incorporated into occupational health policies for rotating shift workers to maximize nurses' health and prevent adverse health effects.

DEVELOPMENT AND EVALUATION OF A NOVEL SHOULDER OCCUPATIONAL EXPOSURE ANALYSIS TOOL (#07006)

Principal Investigator: Clark R. Dickerson

Co-Investigators: Jack P. Callaghan (University of Waterloo); Richard Wotherspoon (Cooper Standard Automotive)

Sponsoring Institution: University of Waterloo

Three-Year Funding: \$172,211.00

This project will convert a complex shoulder model into a practical set of ergonomic assessment tools. These will include an independent software application and a graphical based pencil-and-paper worksheet format, both formats that are used often in ergonomic practice for different body parts. The study will verify the usability of these tools by ergonomics professionals through two rounds of field-testing in a cross-section of Ontario workplaces.

GUIDELINES FOR THE DEVELOPMENT OF RE-ENTRY PROTOCOLS IN SEISMICALLY ACTIVE MINES (#07007)

Principal Investigator: Stephen D. McKinnon (Queen's University)

Co-Investigators: Kristy Tiampo (University of Western Ontario)

Sponsoring Institution: Queen's University

Three-Year Funding: \$243,924.00

Following a large seismic event or rockburst in hard rock mines, there is a short-term increase in aftershock activity, which over time (normally several hours) decays to background levels. During this time of elevated seismic activity the risk of aftershocks with sufficiently high magnitude to cause additional damage is also high. Workers are therefore restricted from re-entering workplaces for a specified time period and within a certain distance of the initial event. Based on a detailed survey of mines in Ontario and overseas carried out in an earlier RAC-funded project, it was found that there are no standard procedures for developing these re-entry protocols, and that a variety of site-specific approaches are being used. The reliability of these procedures varies considerably, and for mines just starting to experience seismicity, there are no guidelines for how re-entry protocols should be developed. The objective of this project is therefore to deliver to the ground control practitioners in Ontario mines a set of guidelines for the development of a site-specific protocol that will enable them to make the best possible decisions regarding when workers can safely re-enter their workplaces following a large seismic event.

AN ETHNOGRAPHIC STUDY OF PROCESS AND EXPERIENCE WITH LABOUR MARKET RE-ENTRY (#07014)

Principal Investigator: Ellen MacEachen (Institute for Work & Health)

Co-Investigators: Agnieszka Kosny, Renée-Louise Franche (Institute for Work & Health); Katherine Lippel (University of Ottawa)

Sponsoring Institution: Institute for Work & Health

Two-Year Funding: \$140,605.00

Although much research has been conducted on early and safe return to work, very little is known about situations when the return is not early or not to the pre-injury employer. When workers cannot return to their original employment because of the nature of their injury or because their employers cannot (or will not) offer them continued work they become clients of the WSIB's Labour Market Re-Entry (LMR) Program. The objective of this study is to gain an understanding of how LMR is carried out and of the particular challenges and opportunities in the LMR process. Using a sociological approach which examines patterns of practice and behaviour, the study will examine direct injured worker and provider experience of LMR. These experiences will be located within their broader contexts of regional differences (access to education, employment and healthcare) as well as contractual and practical aspects of LMR provider integration within the WSIB system.

IMMIGRANT WORKERS' EXPERIENCES AFTER WORK-RELATED INJURY AND ILLNESS (#07015)

Principal Investigator: Agnieszka Kosny (Institute for Work & Health)

Co-Investigators: Ellen MacEachen, Peter M. Smith (Institute for Work & Health); John Shields (Ryerson University)

Sponsoring Institution: Institute for Work & Health

Two-Year Funding: \$164,971.00

Immigrant workers represent a majority of labour force growth. Even with high levels of formal education, immigrant workers are more likely to work in poor-quality, low-paying jobs. Workers with high job insecurity, poor language skills, and limited familiarity with Canadian social programs may face particular challenges when injured at work. They may not report injury if they have poor knowledge of their rights or fear job loss. These workers may also have trouble accessing and navigating the compensation system. Working closely with community groups, this study will examine the experiences of injured immigrant workers in Toronto, a city with the highest level of immigration in Canada.

EXAMINING CHANGES IN INJURIES SUBMITTED AS NO-LOST-TIME CLAIMS IN ONTARIO BETWEEN 1991 AND 2005 (#07016)

Principal Investigator: Peter M. Smith (Institute for Work & Health)

Co-Investigators: Cameron A. Mustard, Sheilah Hogg-Johnson (Institute for Work & Health)

Sponsoring Institution: Institute for Work & Health

Two-Year Funding: \$204,650.00

Between 1991 and 2005 the number of lost-time claims submitted to the WSIB dropped by approximately 42%. However, over the same time period no-lost-time claims dropped by only 4%. As a result, there are currently over twice the amount of no-lost-time claims (NLTCs) reported to the WSIB, than lost-time claims (LTCs). In 2000, the health care costs of NLTCs to the WSIB was in excess of \$20 million. Unfortunately, no information on the types of injuries being reported as NLTCs is routinely stored or reported by the WSIB. Therefore, little is known about why NLTCs have not decreased, or how they might be prevented. The goal of this project is to extract detailed information from the NLTC injury reports submitted during four time periods between 1991 and 2005. The study will also examine the overall trends in the rates and health care costs of NLTCs between 1991 and 2005 across different labour force sub-groups. The results of this study will provide stakeholders in workplace safety with valuable information on how NLTC might be prevented.

BIODYNAMIC RESPONSE OF HUMAN SUBJECTS EXPOSED TO COMPLEX MULTIAXIS VIBRATION (#07021)

Principal Investigator: James P. Dickey (University of Guelph)

Co-Investigators: Tammy R. Eger, Sylvain G. Grenier (Laurentian University); Paul-Émile Boileau (Institut de recherche Robert-Sauvé en santé et sécurité du travail); Michele L. Oliver, Peter Kim (University of Guelph); Subhash Rakheja (Concordia University)

Sponsoring Institution: University of Guelph

One-Year Funding: \$149,085.00

This project will examine the relationship between operator comfort and multiaxis vibration, and will advance current biodynamic techniques in order to assess the health and injury implications of these multiaxis vibrations. The study will perform controlled laboratory-based human studies of multiaxis vibration using a robotic platform that can simultaneously vibrate in all directions, translational as well as rotational. Analysis will concentrate on developing analytical tools for evaluating the human operators' physical responses (biodynamics) and thereby the effect of these vibrations on human subject's health and safety. This research will develop not only an essential laboratory-based tool for analyzing operator responses to multi-axis vibration, but also the theoretical framework for evaluating the health effects of multiaxis vibration via biodynamic measures. This is an essential step for assessing and for mitigating the vibration exposure and its effects.

A BIOMECHANICAL COMPARISON OF FLOOR AND OVERHEAD LIFTS USING ONE OR TWO CAREGIVERS FOR PATIENT TRANSFERS (#07023)

Principal Investigator: Geoffrey R. Fernie (Toronto Rehabilitation Institute)

Sponsoring Institution: Toronto Rehabilitation Institute

Two-Year Funding: \$61,088.00

Nurses injure their backs at alarming rates. Mechanical lifts can reduce the risk of injury due to patient transfers; however, not all lifts do this to the same extent. There are two broad categories of lifts in use. Some are wheeled around on the floor and carry the patients suspended from a sling attached to a boom. Other lifts are suspended from overhead tracks. Previous research has reported that the main difference between the two types of lifts is that caregivers experience greater low back loads when maneuvering patients suspended from floor lifts than when using overhead lifts, but the study used only six subjects. The aim of this study is to provide stronger evidence for the difference between the two types of lifts. It will also determine the influence of the weight of the patient and whether two caregivers working together can reduce the low back loads experienced. Biomechanical estimates of low back stress will be measured in a simulated clinical environment using 20 pairs of caregiver subjects. The results of this study will provide evidence for selecting the most effective lift type to be purchased by institutions or through government incentive programs.

THE ORGANIZATIONAL, ENVIRONMENTAL, AND INDIVIDUAL FACTORS THAT INFLUENCE NURSES' DECISIONS TO USE FACIAL PROTECTION TO PREVENT OCCUPATIONAL TRANSMISSION OF COMMUNICABLE RESPIRATORY ILLNESS IN ACUTE CARE HOSPITALS (#07025)

Principal Investigators: D. Linn Holness (St. Michael's Hospital); Kathryn Nichol (St. Michael's Hospital/University of Toronto)

Co-Investigators: Allison McGeer (Mount Sinai Hospital); Linda O'Brien-Pallas (University of Toronto); Philip L. Bigelow (Institute for Work & Health)

Sponsoring Institution: St. Michael's Hospital

Two-Year Funding: \$107,305.10

The hazards of working in a health care facility are numerous, but the one that has recently topped the concern list is the hazard of contracting an infectious disease from a patient, another health care worker, or the health care environment. The hospital outbreaks of SARS in Toronto in 2003 highlighted the vulnerability of nurses to hospital-spread disease. Studies have shown that one of the main reasons why SARS spread within the hospital setting was that health care workers failed to properly use barrier precautions like respirators, surgical masks, eye protection and gloves. This study will examine the organizational, environmental and individual factors that may influence nurses' compliance with facial protection. Once these

are understood and the most influential factors are identified, hospital leaders and government authorities on worker health and safety can create successful programs and interventions to improve compliance with the recommended use of facial protection. This enhanced compliance should result in a decrease in hospital spread illness to workers and patients.

PREVENTION AND TREATMENT OF ACUTE PSYCHOLOGICAL TRAUMA: A CASE STUDY IN PUBLIC TRANSIT (#07033)

Principal Investigator: Paul S. Links (St. Michael's Hospital)

Co-Investigators: Ash Bender, Peter Farvolden, William Gnam, Carol Strike (Centre for Addiction and Mental Health); Ruth A. Lanius (London Health Sciences Centre); John O'Grady (Toronto Transit Commission); Nathan Taback, Yvonne Bergmans, Kelly Murphy (St. Michael's Hospital)

Sponsoring Institution: St. Michael's Hospital

Three-Year Funding: \$446,069.97

This project will study the treatment and return to work of workers suffering psychological trauma. Many work settings involve traumatic exposures and face issues related to acute and chronic traumatic stress disorders in workers. The Toronto Transit Commission (TTC) is one such setting. Qualitative interviews will explore what traumatized TTC employees perceive as obstacles in overcoming their injury and returning to work. The study will then implement and evaluate a best-practice intervention (BPI) entailing education and training, screening and surveillance, selective specialty referral and return to work coordination.

IN SEARCH OF INNOVATIONS: IDENTIFYING NEW TOOLS AND PROCESSES TO PREVENT MSDs IN THE CONSTRUCTION SECTOR (#07103)

Principal Investigator: Desre M. Kramer (University of Waterloo)

Co-Investigators: Philip L. Bigelow (Institute for Work & Health); Enzo Garritano, Peter Vi (Construction Safety Association of Ontario); Richard P. Wells (University of Waterloo)

Sponsoring Institution: University of Waterloo

One-Year Funding: \$58,739.00

This preparatory study is to develop an understanding how ergonomic innovations are (or are not) adopted in the construction sector. The study aims to identify new innovations that can reduce the risk for musculoskeletal disorders for workers. It will profile innovative companies and gain important information on 'early adopter' companies, and it will study how companies have overcome the barriers to adopting new innovations. The study is a precursor to a larger intervention to disseminate ideas on both ergonomic innovations and the organizational factors that typify innovative companies in the construction sector.

EVALUATING THE EFFECTS OF COLD AND GLOVE USE ON MANUAL DEXTERITY AND PERFORMANCE AND THE TESTING OF POTENTIAL SOLUTIONS (#07104)

Principal Investigator: Richard P. Wells (University of Waterloo)

Co-Investigator: Shannon J. Maracle (Electrical & Utilities Safety Association)

Sponsoring Institution: University of Waterloo

One-Year Funding: \$29,818.00

This study aims to extend previous work and evaluate the effects of cold temperatures on the manual dexterity powerline workers who wear insulated rubber gloves. The effects of the gloves in cold temperatures on workers' manual dexterity will be evaluated through a series of tests of dexterity, finger sensitivity, comfort and effort ratings, and electromyography. A second objective of the project is to evaluate potential solutions to dexterity problems. The project will lead to recommendations on improving powerline workers' ability to work in cold weather.

IDENTIFICATION OF BIOMECHANICAL RISK FACTORS RESPONSIBLE FOR MUSCULOSKELETAL DISORDERS IN THE NORTHERN ONTARIO TREE PLANTING POPULATION (#07110)

Principal Investigator: Geneviève A. Dumas (Queen's University)

Co-Investigator: Peter J. Keir (McMaster University)

Sponsoring Institution: Queen's University

One-Year Funding: \$48,461.30

Nearly 900,000 hectares of Canada's forests are harvested on an annual basis, 379,000 of which are manually re-planted by tree-planters with an estimated 509 million seedlings. These tree-planters consistently carry loads exceeding 16 kg while repetitively bending over 200 times each hour. The goal of this study is to reduce injuries to reforestation workers. Worker posture will be assessed in a field setting by tracking the 3D kinematics of the upper extremities and trunk during the planting task. Planting strategies, such as use of shoulder straps, and tree-unloading methods will be evaluated in the field to determine effect on posture during the planting task. These same strategies will be evaluated in a lab-setting for their effect on both posture and joint loads. These data will provide a basis for design of more ergonomically sound equipment which improves posture to reduce injury to workers.

DEVELOPMENT OF RAPID TECHNIQUES FOR THE IDENTIFICATION OF ASBESTOS FIBRES IN FLOOR TILES USING FOURIER TRANSFORM INFRARED SPECTROPHOTOMETRY (FT-IR) AND TWO-DIMENSIONAL POWDER X-RAY DIFFRACTION (XRD2) METHODS (#07112)

Principal Investigator: Brian E. McCarry (McMaster University)

Co-Investigators: James Britten, Lorraine Shaw (McMaster University)

Sponsoring Institution: McMaster University

One-Year Funding: \$53,555.00

The release of asbestos fibres during removal and maintenance of floor tiles is of concern to regulators and occupational health professionals. Contractors performing floor tile removal and personnel in the building where the removal is taking place may be exposed to asbestos fibres. Asbestos fibres are also released during routine maintenance of asbestos-containing floor tiles. This project will develop and evaluate the suitability of Fourier Transform Infrared Spectrophotometry and Two-Dimensional Powder X-Ray Diffraction for rapid detection of asbestos in floor tiles.

ECONOMIC EVALUATION WORKBOOK FOR WORKPLACE PARTNERS AND SYSTEMS PARTNERS (#07114)

Principal Investigator: Emile Tompa (Institute for Work & Health)

Co-Investigators: Benjamin C. Amick III, Kiera Keown, Anita Dubey, Emma Irvin (Institute for Work & Health)

Sponsoring Institution: Institute for Work & Health

One-Year Funding: \$40,000.00

A recent systematic literature review of workplace interventions with economic evaluations has shown how underdeveloped the methods are in this literature — most intervention studies do not undertake an economic evaluation. Consequently, workplace parties are often not provided evidence on the resource burden of work-related injuries and illnesses or the returns from undertaking health and safety initiatives to prevent them. This gap in evidence is largely due to the dearth of methods guidance on economic evaluation designed expressly for workplace interventions. To fill the gap, this project aims to develop an economic evaluation workbook for workplace parties and system partners.

BRIDGING THE SAFETY GAP FOR VULNERABLE YOUNG WORKERS USING EMPLOYMENT CENTRES (#07115)

Principal Investigator: F. Curtis Breslin (Institute for Work & Health)

Co-Investigators: Matt Wood (Ontario Association of Youth Employment Centres); Cameron A. Mustard (Institute for Work & Health)

Sponsoring Institution: Institute for Work & Health

One-Year Funding: 60,000.00

Young people 15 to 24 years old who are out of school (and especially those with less than a high school diploma) are at particularly elevated risk for work injury. Recently, a Ministry of Labour action group made recommendations to improve safety preparation and reduce work injuries in this "high-risk" subgroup of young workers. This study will help determine the optimal way to improve aspects of occupational health and safety (OHS) for this "high risk" subgroup of young workers who use employment centres, by answering the following research questions: What occupational hazards and injuries has this subgroup encountered, and how does their work and injury experience compare to Ontario youth in general? What work safety education and training has this subgroup received, from what sources, and what is their current knowledge of work safety? Answers to these questions will be obtained through an online survey to be installed in youth employment centres across Ontario.

USER-ACCEPTABILITY AND EFFECTIVENESS OF A PERSONAL LIFT ASSIST DEVICE (PLAD) IN AN AUTOMOTIVE INDUSTRIAL SETTING (#07117)

Principal Investigator: Joan M. Stevenson (Queen's University)

Co-Investigators: Mohammad Abdoli-Eramaki (Ryerson University); Alison Godwin (Laurentian University); Michael Agnes (Virginia Polytechnic Institute and State University)

Sponsoring Institution: Queen's University

One-Year Funding: \$60,000.00

The purpose of this study is to determine the feasibility and acceptability of an on-body Personal Lift Assist Device (PLAD) in an industrial setting. The purposes of the laboratory phases are: 1) to finalize specific design features for improved safety and accessibility; 2) to determine the most appropriate spring element tensions to off-load the erector spinae muscles by the same amount irrespective of workers' height and weight; and 3) to examine task-specific preferences in spring element tensions based on task working postures. The project's second phase will take place at Toyota Motor Manufacturing Canada in Cambridge, Ontario. The purpose of the industry phase is to examine user acceptability and effectiveness of PLAD during repetitive static holding and dynamic lifting assembly-type tasks.

OPTIMIZING SEAT SELECTION TO MINIMIZE SIX DEGREE-OF-FREEDOM WHOLE-BODY VIBRATION IN INTEGRATED STEEL MANUFACTURING MOBILE MACHINERY (#07120)

Principal Investigator: Michele L. Oliver (University of Guelph)

Co-Investigators: James P. Dickey (University of Guelph); Tammy R. Eger (Laurentian University); Patricia Hope (Algoma Steel)

Sponsoring Institution: University of Guelph

One-Year Funding: \$60,000.00

Whole-body vibration exposure in the integrated steel manufacturing sector is associated with a whole host of injuries and ailments amongst operators of large mobile machines. Given the rough roads that large mobile machines utilized in steel making must travel, mobile machine operators in steel making environments are probably exposed to 6 degree-of-freedom (DOF) whole-body vibration. Worker focus groups and injury statistics from one integrated steel manufacturer have identified four machines that are potentially problematic from a whole-body vibration exposure perspective. These four machine types are commonly used throughout the steel manufacturing industry. The purpose of this study is to quantify chassis 6-DOF accelerations during normal field operation of these machines. Results from this study will provide the steel industry with information to more efficiently retrofit existing machines which may be related to a substantial number of lost-time claims due to ailments associated with whole-body vibration exposure.

DEVELOPMENT OF A GREEN LIGHT AND RED FLAG TOOLKIT FOR PERSISTENT CLAIMS (#07127)

Principal Investigator: Ellen MacEachen (Institute for Work & Health)

Co-Investigator: Agnieszka Kosny (Institute for Work & Health)

Sponsoring Institution: Institute for Work & Health

One-Year Funding: \$39,916.55

A problem facing the WSIB and prevention system partners is the growing number of persistent, or long-term, workers' compensation claims. Although claim rates have declined in recent years, the duration of existing claims is growing. This problem could be reduced if key players who represent or make decisions about claims were able to identify situations when procedures are working particularly well and, conversely, when workers may be at risk of not being able to complete their expected return-to-work trajectory. Using an existing qualitative database, the project aims to develop a Green Light and Red Flag Toolkit for Persistent Claims. The toolkit will be work-shopped with a range of system users. The toolkit should further the development and targeted application of system resources, assist with more efficient use of existing system resources, and improve the claims experience of injured workers.

INVOLVING STAKEHOLDERS IN THE PLANNING OF A WORKPLACE INTERVENTION TO IMPROVE RETURN TO WORK: PUTTING WHAT WE KNOW INTO ACTION USING AN INTERVENTION MAPPING APPROACH (#07129)

Principal Investigator: Carlo Ammendolia (University Health Network)

Co-Investigators: J. David Cassidy, Eleanor W.G. Boyle, Pierre Côté, Monique Gignac (University Health Network); Ivan Steenstra, Claire Bombardier (Institute for Work & Health); Patrick Loisel (University of Sherbrooke)

Sponsoring Institution: University Health Network

One-Year Funding: \$59,332.60

Back pain is the leading cause of morbidity and lost productivity in the workplace. Two recent studies, one in Quebec and the other in The Netherlands, demonstrated that early intervention at the workplace using shared decision-making and return to work (RTW) coordination may hold promise in improving RTW and reducing disability following a low-back injury. Intervention Mapping is a systematic method for designing multifaceted interventions. It combines best evidence, theory and the experience of important stakeholders at each step in the design and implementation of the intervention. The purpose of this study is to refine an intervention using focus groups with injured workers, injured worker groups, employers, unions, clinicians, claims adjudicators, and RTW coordinators. The goal is to distill and contextualize what is known about improving RTW into a welldefined, practical and feasible intervention tailored to the Ontario setting.

DEVELOPMENT OF A MEASURE OF SOCIAL SUPPORT FOR WORKPLACE-BASED DISABILITY MANAGEMENT (#07131)

Principal Investigator: Rosemary M. Lysaght (Queen's University)

Co-Investigators: Sherrey Larmour-Trode (Limestone Health Consultants Inc.); Mary Ann McColl, Leandre Fabrigar (Queen's University); Margaret Friesen (University of Manitoba)

Sponsoring Institution: Queen's University

One-Year Funding: \$28,281.00

This project will validate a measure of social support relevant to the disability management process by testing a prototype tool with 500 workers in accommodated work situations. Statistical analysis will reduce the number of items and establish psychometric properties. Additional activities will build the infrastructure for a larger study of the role of social support in enhancing workplace-based rehabilitation outcomes. Beyond its value as an outcome measure for research concerning the psychosocial aspects of workplace disability management, this tool may serve as a quality management tool for human resource professionals engaged in continuous improvement of disability management programs.

RESPONDING TO WORKPLACE HAZARDS AND INJURIES: THE INFLUENCE OF ETHNICITY, RACE, DISCRIMINATION, AND IMMIGRANT STATUS (#08001)

Principal Investigator: Alan Hall (University of Windsor)

Co-Investigators: Tanya Basok, Omar Bourouh, Jamey Essex, Urvashi Soni-Sinha (University of Windsor)

Sponsoring Institution: University of Windsor

Three-Year Funding: \$140,000.00

This study addresses four main questions: Are minority workers less likely to report injuries, health problems and hazards to WSIB, their employer, and their union? Are the differences greater when the minorities are new immigrants or refugees? Are differences in reporting related to perceived lack of control over work and working conditions and to employment and financial security? And, are injury reporting and the lack of control and insecurity related to the experience of racism or discrimination in employment?

HEALTH EFFECTS OF DIESEL EXHAUST EXPOSURE AMONG CONSTRUCTION OPERATING ENGINEERS (#08002)

Principal Investigator: Murray M. Finkelstein (University of Toronto)

Co-Investigators: Dave K. Verma (McMaster University)

Sponsoring Institution: University of Toronto

Two-Year Funding: \$217,200.00

A previous RAC-funded study found that diabetes mortality rates were 75% higher among diesel-exposed members of the International Union of Operating Engineers, and that ischemic heart disease mortality rates were 32% higher, than among members of other construction unions. It is crucial to determine whether these increased disease rates are attributable to occupational or to personal factors. The objective of this research is therefore to study the prevalence of heart disease and diabetes in relation to diesel exhaust exposure while controlling for personal risk factors such as smoking and obesity, data not available to the investigators in the earlier mortality studies.

ENCOURAGING CONSTRUCTION COMPANIES TO ADOPT INNOVATIONS TO REDUCE MSDs USING DIFFERENT KNOWLEDGE TRANSFER TECHNIQUES (#08007)

Principal Investigator: Desre M. Kramer (University of Waterloo)

Co-Investigators: Philip L. Bigelow, Richard P. Wells (University of Waterloo); Peter Vi, Enzo Garritano (Construction Safety Association of Ontario)

Sponsoring Institution: University of Waterloo

Three-Year Funding: \$348,870.00

The objective of this research is to identify ten innovations (tools, processes, ideas) that have been evaluated and determined to both reduce the risk of MSDs in construction work, and have the potential to be used intensively in the sector. Different strategies will be used to help spread awareness about these innovations to a large network of construction workplaces and unions. The study will produce a best-practices document on knowledge transfer to improve the adoption rates of innovations for preventing MSDs in the construction sector.

A VERSATILE AND COMPREHENSIVE MODEL TO PREDICT THE EFFORT REQUIRED BY THE HAND AND WRIST DURING MANUAL WORK: DEVELOPMENT AND EVALUATION (#08008)

Principal Investigator: Richard P. Wells (University of Waterloo)

Co-Investigators: Russ Tupling (University of Waterloo); Shannon Hunt (Electrical & Utilities Safety Association)

Sponsoring Institution: University of Waterloo

Three-Year Funding: \$240,999.00

High forces that workers exert with their hands are the single biggest cause of musculoskeletal disorders (MSDs). Workers must often wear gloves and these can substantially add to the forces required. The versatility of the hand means that prediction of the loads incurred during manual work must account for a wide range of factors. Adding to previous work, this study will collect hand and arm loads while workers perform a wide range of hand activities both with and without gloves. The effects of grip type, wrist angles and friction on workers' fatigue and

MSD risk factors will be determined. The goal of this proposal is to construct a versatile, comprehensive method for assessing hand forces and their contribution to workers' fatigue and MSD development that can be used in creating good tools and work environments before workers become injured.

THE SAFETY CASE FOR BUSINESS: A MULTI-STAKEHOLDER EXAMINATION OF BEST PRACTICES AND HEALTH AND SAFETY OUTCOMES (#08010)

Principal Investigator: Mark D. Pagell (York University)

Co-Investigators: Markus Biehl, David Johnston (York University); Robert Klassen (University of Western Ontario); Emile Tompa, Sheilah Hogg-Johnson, Lynda Robson, Benjamin C. Amick III (Institute for Work & Health); Anthony Veltri (Oregon State University)

Sponsoring Institution: York University

Three-Year Funding: \$387,300.00

There is a large body of research on how to improve the economic performance of an organization or the health and safety performance of an organization. However, there is little research that looks at health and safety and economic outcomes simultaneously. This study will use multi-industry case studies and a survey of Ontario production facilities to simultaneously examine best known operating and health and safety practices, and to study the influence of these practices on both economic and health and safety outcomes.

ASSESSMENT OF THE EFFECTIVENESS OF HEAVY MACHINERY SEATS FOR MULTI-AXIS VIBRATION ENVIRONMENTS (#08011)

Principal Investigator: James P. Dickey (University of Guelph)

Co-Investigators: Tammy R. Eger (Laurentian University); Michele L. Oliver (University of Guelph); Subhash Rakheja (Concordia University)

Sponsoring Institution: University of Guelph

Three-Year Funding: \$299,995.00

Whole-body vibration is a significant health risk for between 4% and 7% of the work force in North America. Industrial seats are one of the features of machinery that is designed to reduce the vibration exposure. Although many industrial seats are available, there is little objective evidence comparing different seats, and some seats amplify the vibrations rather than attenuate them. The purpose of this project is to perform a controlled study evaluating the effectiveness of different industrial seats. The results will allow workplaces to select the seats that are best suited to their particular vibration environment.

EVALUATION OF INFRARED THERMOGRAPHY FOR THE DIAGNOSIS OF RAYNAUD'S PHENOMENON IN WORKERS WITH HAND-ARM VIBRATION SYNDROME (#08012)

Principal Investigator: Ronald A. House (St. Michael's Hospital)

Co-Investigators: D. Linn Holness (St. Michael's Hospital); Ihor Taraschuk (Workplace Safety and Insurance Board)

Sponsoring Institution: St. Michael's Hospital

Two-Year Funding: \$236,576.00

Many workers are exposed to hand-arm vibration and are at risk of developing Hand-Arm Vibration Syndrome (HAVS). The vascular abnormality in HAVS consists of cold induced finger blanching and pain and can have an impact on work and quality of life. Consequently it is important to have a test to objectively diagnose the vascular component of HAVS. Infrared thermography is a new test that obtains a thermal image of the entire hand and fingers and allows measurement of the temperatures of the fingers and hands at various sites at the same point in time. This test may improve our ability to diagnose the vascular component of HAVS. This study will determine if the test is accurate in diagnosing HAVS, and will establish a test protocol that could be used in various clinical centres.

EVALUATION OF FIBRE EXPOSURES OUTSIDE OF ASBESTOS ABATEMENT ENCLOSURES (#08013)

Principal Investigators: Paul R. Bozek, Andrea M. Sass-Kortsak (University of Toronto)

Co-Investigator: Dru Sahai (Construction Safety Association of Ontario)

Sponsoring Institution: University of Toronto

Two-Year Funding: \$86,150.00

As of November 2007, the Ontario government requires that asbestos removal workers on large scale asbestos removal projects be licensed, and undergo a course of prescribed training. Asbestos removal work is conducted inside temporary plastic enclosures to keep the asbestos from contaminating the rest of the building. Workers inside the enclosures use respirators and must decontaminate themselves prior to exiting the enclosure. This study will investigate if airborne asbestos fibres are confined inside the temporary plastic enclosures during the removal of waste bags out of the enclosure, through door flaps. This project will also assess whether airborne asbestos is released into buildings, as workers shower and exit the enclosure at the end of a shift. If airborne asbestos is found outside the asbestos removal enclosures, this study aims to determine factors that influence how much becomes airborne. The goal is to inform asbestos workers as to the best ways of ensuring fibres remain confined and do not contaminate air outside their work areas.

DETERMINATION OF ONTARIO FIREFIGHTERS' EXPOSURE TO PARTICULATE, VOLATILE, AND SEMI-VOLATILE ORGANICS DURING FIREFIGHTING INCLUDING MEASUREMENTS OF AIR CONCENTRATIONS, SKIN CONCENTRATIONS, AND PAH METABOLITES IN URINE (#08016)

Principal Investigator: Brian E. McCarry (McMaster University)

Co-Investigators: Harry S. Shannon, Dave K. Verma, Lorraine Shaw (McMaster University)

Sponsoring Institution: McMaster University

Three-Year Funding: \$277,561.00

Firefighting is a hazardous occupation and firefighters are routinely exposed to heat, stress and a large number of toxic chemicals, including acid gases, benzene, carbon monoxide, formaldehyde, hydrogen cyanide, oxides of nitrogen and polycyclic aromatic hydrocarbons. Some of these compounds are known carcinogens and exposures can occur through inhalation and through the skin. This study will compare new and conventional analytical approaches to determining exposures of firefighters to toxic chemicals during firefighting. Measuring these compounds in the air during a fire is difficult because traditional sampling equipment takes time to set up and firefighters are not able to wear additional equipment along with their Self-Contained Breathing Apparatus and other protective equipment under these difficult and strenuous working conditions. Therefore, a small, unobtrusive and easily deployed "passive sampler" (called the "Twister®") will be used to measure firefighters' exposures.

MULTIMORBIDITY, DEPRESSION, AND PAIN IN THE WORKPLACE: POTENTIAL RISK FACTORS FOR WORK ABSENCE AND WORK LIMITATIONS IN CANADIAN NURSES (#08023)

Principal Investigator: Renée-Louise Franche (Institute for Work & Health)

Co-Investigators: Pierre Côté, Cameron A. Mustard, Selahadin Ibrahim, Peter M. Smith (Institute for Work & Health); Jaime Guzman (Occupational Health & Safety Agency for Healthcare [British Columbia]); Mieke Koehoorn (University of British Columbia)

Sponsoring Institution: Institute for Work & Health

Two-Year Funding: \$120,638.00

Currently, 22% of the working population has at least two co-existing chronic health conditions, with an increasing number of conditions affecting older workers. Depression and painful conditions (e.g., back pain) are common. Compared to other workers, Canadian healthcare workers are at high risk for missing work because of illness (work absence), but often also feel compelled to continue working despite health problems, resulting in a limit in their work activities (work limitations). Healthcare workers, namely nurses, also face unique and difficult work conditions. This study will examine the responses of 17,437 female nurses to Statistics Canada's 2005 Study of the Work and Health of Nurses survey to better understand how having more than one health condition, depression, and/or pain may result in longer work

absences and more work limitations in combination with difficult workplace conditions. Study results will guide development of workplace strategies to accommodate the needs of workers affected by poor health. The findings will support changes to workplace conditions that may assist workers with chronic health conditions to lead productive working lives. These changes can help organizations be successful at bringing nurses back to work and keeping them healthier throughout their working lives.

A RANDOMIZED CONTROLLED TRIAL OF THE EFFECTIVENESS OF TWO OFFICE ERGONOMIC TRAINING APPROACHES FOR SEATED ENVIRONMENTS: COMPARING AN IN-PERSON TO COMPUTER-BASED TRAINING (#08024)

Principal Investigator: Benjamin C. Amick III (Institute for Work & Health)

Co-Investigators: Ivan Steenstra, Peter M. Smith, Donald C. Cole, Emile Tompa, Philip L. Bigelow, Dorcas E. Beaton (Institute for Work & Health); Michelle Robertson (Liberty Mutual Research Institute for Safety)

Sponsoring Institution: Institute for Work & Health

Two-Year Funding: \$235,047.00

In the most recent systematic review of the office ergonomics intervention literature, randomized trials of training programs were indicated as a needed area of research to move towards a more definitive research base for evidence informed practices. To fill the gap, this study will examine whether an office ergonomics training program developed using participatory instructional system design and adult active learning models can effectively prevent musculoskeletal symptoms. The study will also compare several types of training (in-person vs. computer-based, and active vs. passive) to help inform decision which type of training program is more effective in preventing injuries and reducing lost productivity.

THE BEHAVIOURAL INCENTIVES OF EXPERIENCE RATING: AN INVESTIGATION INTO THE HEALTH AND SAFETY CONSEQUENCES OF THE NEW EXPERIMENTAL EXPERIENCE RATING PROGRAM IN ONTARIO (#08025)

Principal Investigator: Emile Tompa (Institute for Work & Health)

Co-Investigators: Benjamin C. Amick III, Sheilah Hogg-Johnson, Lynda Robson (Institute for Work & Health)

Sponsoring Institution: Institute for Work & Health

Two-Year Funding: \$121,960.00

Experience rating of workers' compensation insurance premiums is a common practice in North America. It is meant to create incentives for firms to invest in safety by varying their premiums based on their claims activity. Though experience rating is a principal policy lever of workers' compensation insurance providers, few studies have investigated its effects with direct measures of program features. The principal experience rating program in Ontario is the New Experimental Experience Rating (NEER) program. Since its introduction in 1984, only a handful of studies have been undertaken on it, none of which consider the impact of varying the degree of experience rating or the incentive created by the rebates and surcharges of the program. This study will investigate various features of the NEER program through rigorous statistical methodologies, using direct measures, in order to identify the range of behavioural incentives created by the program.

THE PROBLEM OF CLAIMS PERSISTENCE: WHAT IS DRIVING INCREASES IN PERSISTENT AND LOCKED-IN CLAIMS? (#08027)

Principal Investigator: Sheilah Hogg-Johnson (Institute for Work & Health)

Co-Investigators: Emile Tompa, Benjamin C. Amick III (Institute for Work & Health)

Sponsoring Institution: Institute for Work & Health

Two-Year Funding: \$182,583.78

Claims for work injury are said to be persistent if they continue to be active and open, with ongoing wage replacement benefits, for a long time. Claims persistence appears to have been increasing recently for Ontario WSIB work injury claims. This study will provide information to understand better the problem of claims persistence. Using WSIB claim information from 1990 to 2004, the study will provide information on how much persistence has increased over time, and will identify key indicators of claims persistence. In particular, the study will investigate the possible effects of policy changes introduced in 1998 on claims persistence.

DEVELOPMENT OF AN ONTARIO-WIDE SURVEY TO STUDY FACTORS IMPACTING THE HEALTH AND SAFETY OF TRUCK DRIVERS IN ONTARIO (#08031)

Principal Investigator: Philip L. Bigelow (University of Waterloo)

Co-Investigators: Sheilah Hogg-Johnson, Benjamin C. Amick III (Institute for Work & Health); Karl Sieber (U.S. Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health)

Sponsoring Institution: University of Waterloo

One-Year Funding: \$29,905.00

Truck drivers experience high rates of injury and illness, and their involvement in motor vehicle collisions (MVCs) often results in injuries to others who use Ontario's highways. Little, however, is known about the factors that place truck drivers at risk of injury or collision. A provincial survey, linked to a nationwide survey in the US, would provide data that would address the surveillance needs of truck drivers and inform the development of programs to improve health and safety and reduce the risk of MVCs. This development project will engage stakeholders in Ontario to ensure a future provincial survey of truck drivers addresses specific issues/needs facing drivers in the province's transportation sector. The project will collaborate with US investigators from the National Institute for Occupational Safety and Health (NIOSH) who are planning a US national truck driver health and safety survey.

A RANDOMIZED CONTROLLED STUDY OF TARGETED OCCUPATIONAL HEALTH AND SAFETY CONSULTATION IN ONTARIO (#08035)

Principal Investigator: Sheilah Hogg-Johnson (Institute for Work & Health)

Co-Investigators: Linda Robson, Donald C. Cole, Benjamin C. Amick III, Peter M. Smith, Emile Tompa, Cameron A. Mustard (Institute for Work & Health)

Sponsoring Institution: Institute for Work & Health

One-Year Funding: \$59,700.00

The Ontario Ministry of Labour's High Risk Firm Initiative (HRFI) aims to reduce Workplace Safety & Insurance Board (WSIB) claims through (a) intensive enforcement (4 inspections per year) by the Ministry of Labour in the 2% worst performing firms under provincial jurisdiction, and (b) less intensive enforcement (1 inspection per year) by the Ministry or consultation by the Health and Safety Associations in the next worst 8% of firms. The study will analyze the impact of the HRFI in the latter group of firms in two industrial sectors. Firm-level intervention activity data obtained from selected Health and Safety Associations and the Ministry of Labour will be linked to claims data from the WSIB to determine whether either of the HRFI interventions led to better claims outcomes.

MECHANICAL ANALYSES TO ENHANCE THE SAFETY OF HEAVY MINING VEHICLE RIM AND WHEEL ASSEMBLIES (#09002)

Principal Investigator: William J. Altenhof (University of Windsor)

Co-Investigators: Richard Banting (Mines and Aggregates Safety and Health Association); Robert Birks (Goodyear Canada); Pat Skeldoch (J & M Tire International Incorporated); Don Trottier (North Shore Industrial Wheel Manufacturing)

Sponsoring Institution: University of Windsor

Three-Year Funding: \$226,707.26

Multi-piece rim assemblies have been associated with a number of serious injuries and fatalities in Ontario and throughout the world. The proposed research study will assemble university researchers and industrial experts with experience in the areas of structural testing and heavy mining vehicles to investigate innovative designs to enhance the safety of multi-piece rim assemblies. The research team will also investigate the long term objective of potentially eliminating the use of multi-piece mining wheels through replacement of a single piece rim which has historically proven to be involved with a far lower number of incidents. Fitting a large mining vehicle tire onto a single piece rim has challenges and thus the research group will consider innovative design approaches to the rim and the necessary mechanical equipment to fit the tire onto the rim without damaging either the tire or rim.

EXAMINATION OF VIBRATION CHARACTERISTICS AND BENEFITS OF 'ANTI-VIBRATION' MATS AND INSOLES FOR WORKERS EXPOSED TO VIBRATION VIA THE FEET (#09006)

Principal Investigator: Tammy R. Eger (Laurentian University)

Co-Investigators: James P. Dickey (University of Western Ontario); Alston Godwin, Raphael Zory, Sylvain Grenier (Laurentian University)

Sponsoring Institution: Laurentian University

Two-Year Funding: \$63,784.00

Prolonged exposure to hand-transmitted vibration has been shown to cause musculoskeletal problems to the hand and arm. Workers who are exposed to vibration via the feet could also be at risk for similar health problems to the feet and lower legs; however, very few studies have examined the characteristics of vibration entering the body via the feet. Workers who are exposed to vibration at the feet have reported lower leg discomfort and they have reported numb and tingling feet. This research project will provide details about vibration characteristics associated with workplace standing vibration exposures. Mats and insoles found to attenuate vibration could be beneficial in reducing harmful health effects associated with vibration exposure via the feet.

WORK DISABILITY TRAJECTORIES AND CLAIM DURATION IN ONTARIO UNDER THREE WORKERS' COMPENSATION LEGISLATIONS (#09012)

Principal Investigator: Emile Tompa (Institute for Work & Health)

Co-Investigators: Sheilah Hogg-Johnson, Benjamin C. Amick, Heather Scott-Marshall (Institute for Work & Health)

Sponsoring Institution: Institute for Work & Health

Two-Year Funding: \$141,088.00

Since the early 1990s, the time on benefits has been increasing for Ontario workers' compensation claims. Over the last decade, there has been a dramatic increase in the number of total compensated days per lost time claim and an increase in the rate of claims remaining active and open for extended periods of time. This trend is in contrast to the trend of declining claim rates experienced over much of the 1990s. This study will use information from a linked database to investigate the labour-market earnings patterns of short- and long-term disability claimants from three different time periods and receiving benefits under three different programs (the pre-1990 Bill 101 program, the 1990-1997 Bill 162 program, and the post-1998 Bill 99 program). Based on the analysis of three successive claimant cohorts, the study will provide information to understand better the individual and contextual factors that contribute to labour-market engagement and earnings recovery, and how these have changed over time.

A PREDICTION RULE FOR DURATION OF DISABILITY BENEFITS IN WORKERS WITH NON-SPECIFIC LOW BACK PAIN (#09014)

Principal Investigator: Ivan A. Steenstra (Institute for Work & Health)

Co-Investigators: Jason W. Busse, Sheilah Hogg-Johnson, Benjamin C. Amick, David Tolusso, Andrea Furlan (Institute for Work & Health)

Sponsoring Institution: Institute for Work & Health

Two-Year Funding: \$79,692.81

If a worker hurts his/her back at work, many people want to know how long it will take before return to work. The worker wants to know because a prolonged recovery period may lead to insecurity and anxiety. The workplace wants to know whether it should make alternate work arrangements. The WSIB wants to know, to guide intervention decisions for early and safe return to work. This study will examine which combination of factors best predicts disability outcomes for these workers. The study will review information routinely collected by the WSIB. Next, it will enhance this data with data from a research study. This survey data may suggest additional information that should be collected by the WSIB, perhaps during the case manager's first contact with the injured worker. The final product will be a computerized prediction tool that will provide projections of different injured worker outcomes, such as time remaining on benefits and likelihood of a recurrence.

UNDERSTANDING THE MANAGEMENT OF INJURY PREVENTION AND RETURN TO WORK IN TEMPORARY WORK AGENCIES (#09015)

Principal Investigator: Ellen MacEachen (Institute for Work & Health)

Co-Investigators: Agnieszka Kosny, Ron Saunders (Institute for Work & Health); Katherine Lippel (University of Ottawa)

Sponsoring Institution: Institute for Work & Health

Three-Year Funding: \$208,941.00

Temporary work agencies are a growing phenomenon and a part of new flexible labour markets where organizations quickly increase or decrease labour in response to demand for their product. There are more than 1,300 temporary work agencies in Ontario. The three-way employment relationship between the worker, agency, and client employer creates special challenges for managing workers' job conditions, injury risks, and return-to-work. This study will provide an understanding of how temporary work agencies are organized and how they manage injury prevention and return to work. It will also shed light on legal responsibilities and client understandings of responsibilities for prevention. The study will conduct an analysis of legislation, case law, and policy governing Ontario temporary work agencies, focus groups with workers hired by temporary agencies and hiring employers, and in-depth interviews with temporary work agency managers.

IMPROVING THE WORKING ENVIRONMENT IN POLICE CRUISERS: REDUCING OFFICERS' PHYSICAL RISKS OF THE LOW BACK AND UPPER EXTREMITY (#09018)

Principal Investigator: Jack P. Callaghan (University of Waterloo)

Co-Investigators: Clark R. Dickerson (University of Waterloo)

Sponsoring Institution: University of Waterloo

Three-Year Funding: \$204,740.00

Police vehicles have become mobile offices. Advancing technology has resulted in these vehicles containing more equipment, including mobile data terminals, card scanners and citation printers. Unlike office settings that have a long ergonomic design history, the constrained vehicle environment is lacking information to guide optimal configurations for police officer health and safety. Back and shoulder problems are the most common complaints of mobile police officers. These are partly attributable to the awkward postures required to use the computer keyboard and screen. These postural concerns are compounded by the prolonged seated exposures officers undergo, which are documented to result in a six-fold increase in lost time episodes. This study aims to improve this situation by examining alternate seating solutions, on-person equipment placements, and identifying ideal locations for vehicle computer installation, both experimentally and through computer simulations. During all stages of the project, input will be gathered from police officers and health and safety personnel to confirm the feasibility of design modifications. Final design suggestions will be refined through consultation with health and safety associations and a regional police force. The project's major product will be a set of guidelines that are practically useful and highly informative for police vehicle design.

DEVELOPING AND EVALUATING A WORKPLACE-LEVEL MSD PHYSICAL RISK FACTOR SURVEY: A RESEARCHER-LABOUR COLLABORATIVE PROJECT (#09019)

Principal Investigators: Richard P. Wells (University of Waterloo); Keith L. McMillan (Communications, Energy and Paperworkers Union of Canada Ontario Region)

Co-Investigators: Desre M. Kramer, Philip L. Bigelow (University of Waterloo); Syed Naqvi (Occupational Health Clinics for Ontario Workers); Lynda Robson, Ivan A. Steenstra (Institute for Work & Health)

Sponsoring Institution: University of Waterloo

Two-Year Funding: \$83,947.00

While there are many published ergonomics checklists and assessment methods for musculoskeletal disorder physical risk factors, they are overwhelmingly designed to assess a single person's exposure or a single workstation. In comparison, there are very few ways to assess MSD physical risk factors at the workplace level. It would be impractical to measure hundreds or thousands of workplaces by surveying large samples of workers or workstations in each workplace. The primary objective of this study is to develop a method to assess efficiently MSD physical risk factors at the workplace level and to measure its reliability and its

usefulness to workplace parties. This project will be conducted as a collaborative research project between labour and researchers.

DEVELOPMENT OF VALID AND RELIABLE PHYSICAL EXPOSURE MEASURES FOR USERS OF HAND-HELD MOBILE COMMUNICATION DEVICES (#09020)

Principal Investigator: Richard P. Wells (University of Waterloo)

Co-Investigators: Benjamin C. Amick, Ivan A. Steenstra (Institute for Work & Health)

Sponsoring Institution: University of Waterloo

One-Year Funding: \$29,782.00

The use of new technology often brings new risk factors into the workplace. Currently there is a perception that the use of hand-held devices is a concern and that heavy users may suffer pain and disability of the thumb — the so called “texting thumb”. This development study has the objective of developing valid and reliable physical exposure measures for users of hand-held mobile communication devices to investigate this potential association. The researchers have developed a pilot exposure questionnaire; however, the literature on computer and mouse usage shows that such an approach is of variable reliability and validity. The project will evaluate the questionnaire by comparing it to directly measured participants’ usage and measures of physical demands on the upper limb, especially the thumb. This work will give new insights into mobile hand-held device use but most importantly, the exposure measures developed will be incorporated into a proposal for a high quality epidemiological study.

JOINT HEALTH AND SAFETY COMMITTEES: WHAT IS THEIR IMPACT IN THE ACUTE CARE HOSPITAL? (#09024)

Principal Investigators: D. Linn Holness (St. Michael’s Hospital); Laureen J. Hayes (University of Toronto)

Co-Investigators: Irena Kudla (St. Michael’s Hospital); Kathryn Nichol (Ontario Safety Association for Community & Healthcare); Linda O’Brien-Pallas (University of Toronto)

Sponsoring Institution: St. Michael’s Hospital

Two-Year Funding: \$155,704.00

Concern regarding the function and effectiveness of Joint Health and Safety Committees (JHSCs) in hospitals was raised in investigations of the SARS outbreak in Toronto in 2003. Questions still remain regarding the understanding of their role and whether workers and management view JHSCs as vital to health and safety in an organization. This qualitative study aims to describe hospital worker and management and healthcare sector stakeholder views of JHSCs. Interviews of key hospital informants and external stakeholders and focus groups involving representatives from all levels within three acute care hospitals of different sizes will be carried out. Information will be obtained about JHSC structures and processes, knowledge of the JHSC and its roles, perceptions of JHSC impact including effectiveness and visibility, and ways to measure effectiveness. If the study identifies gaps in the understanding of the JHSC and its role, educational materials will be developed to address these shortcomings. Ideas regarding measuring effectiveness of the JHSC will inform the development of an evaluation tool. Collaborators from key healthcare stakeholders will form an Advisory Committee to assist in the dissemination of the results, the development of educational and assessment tools and the identification of future research.

MEASUREMENT ACCURACY AND PRECISION OF SHORT-PERIOD AIR SAMPLING BY DIRECT-READING INSTRUMENTS (#09025)

Principal Investigator: Ian Drummond (University of Toronto)

Co-Investigator: Paul Bozek (University of Toronto)

Sponsoring Institution: University of Toronto

One-Year Funding: \$29,710.00

Short, high concentration exposures to airborne chemicals can be of concern, even if the exposure over a full work-shift is not considered a risk to long-term health. Many chemicals have legal exposure limits that include specified short-term limits. For those that do not, Ontario law specifies short-term limits expressed as a multiple of the full-shift limit. This study will test electronic air-sampling instruments that can be worn by the worker all day, continuously collecting data. The project will test if the instruments are as statistically precise

and accurate as the validated standard methods. If they are, it will be easier and less expensive to determine if workers are exposed to excessive levels of chemicals in the workplace.

ASSESSING RETURN TO WORK STATUS QUESTIONNAIRES IN AN OCCUPATIONAL REHABILITATION POPULATION (#09028)

Principal Investigators: Eleanor Boyle, Pierre Côté (University Health Network)

Co-Investigators: Marja Stupar, J. David Cassidy (University Health Network)

Sponsoring Institution: University Health Network

Two-Year Funding: \$32,186.66

A systematic review of the literature found numerous definitions on how to define return-to-work from first day back to work regardless of modifications to working at least 30 days at the same job with no modifications at the same level of pay. The review was not able to uncover a questionnaire which could be used to define a self-report return-to-work status measure. Based on the systematic review and with discussion with stakeholders, the researchers have developed a return-to-work measure that can be used in research and in clinical studies. To ensure the measure is valid, this study will examine the face validity, content validity, short-term test-retest reliability, concurrent validity and criterion validity of the measure in musculo-skeletal occupational cohorts. The occupational cohorts will be composed of individuals who had surgery and/or treatment at University Health Network Rehabilitation Solutions (UHN-RS) and had been injured at least one month to over two years prior to enrollment in the cohorts.

BENCHMARKING LEADING ORGANIZATIONAL INDICATORS FOR THE PREVENTION AND MANAGEMENT OF INJURIES AND ILLNESSES (#09032)

Principal Investigator: Benjamin C. Amick (Institute for Work & Health)

Co-Investigators: Sheilah Hogg-Johnson, Lynda Robson, Cameron A. Mustard, Ivan A. Steenstra, Peter M. Smith, Emile Tompa (Institute for Work & Health)

Sponsoring Institution: Institute for Work & Health

Three-Year Funding: \$363,072.00

This study will conduct a cross-sectional survey of the usage of leading safety indicators by the Ontario firms served by five Health and Safety Associations. It will survey up to 5,000 firms to gauge usage of 70 pre-defined organizational metrics related to safety policies and practices, leadership, ergonomics, safety culture, Joint Health & Safety Committees, and OHS management systems. The study will attempt to show if usage of such metrics correlates with injury rates by cross-referencing with WSIB injury data. The overall long-term objective is to build a base of evidence for benchmarking indicators of corporate organizational and management behaviour in OHS that is broadly relevant to all sectors and firms.

RESPONDING TO TEMPORARY MIGRATION IN ONTARIO'S AGRICULTURAL WORKPLACES (#09034)

Principal Investigator: Jenna Henneby (Wilfrid Laurier University)

Co-Investigators: Michael W. Pysklywec, Michelle Tew (Occupational Health Clinics for Ontario Workers); Ted Haines, Sandra M. Issacs (McMaster University)

Sponsoring Institution: Wilfrid Laurier University

Two-Year Budget: \$130,000.00

There is a sizable temporary migrant worker population that comes to Ontario to work in the agricultural industry each year. These individuals work in a high risk industry and face many barriers to accessing health care, including language, fear of loss of employment, or return to their country of origin. Occupational health and safety problems may be common for this group, and it is likely that a number of these issues go unreported. This study will examine the occupational health experiences of migrant workers in Ontario and will describe the number and types of occupational health and safety issues affecting this group, and characterize the accessibility to health care services and insurance for these workers, as well as the barriers faced in seeking and providing care or coverage.

INTEGRATING OHS INTO OPERATIONS RESEARCH MODELS FOR LONG-TERM WORK SYSTEM PERFORMANCE EVALUATION (#09035)

Principal Investigator: Patrick W. Neumann (Ryerson University)

Co-Investigators: Mohamed Ismail (Ryerson University); Linda M.O. Rose (Royal Institute of Technology, Stockholm)

Sponsoring Institution: Ryerson University

One-Year Funding: \$29,411.00

Can profit motive serve the health and safety imperative? Poor health and safety leads to 'phantom profits' for companies. 'Phantom profits' occur when companies' expected profits are compromised by the costs of employee injury and illness. Beyond compensation costs, employee absenteeism causes losses due to reduced performance, increased quality deficits, and elevated training and administrative costs for rehabilitating and replacing employees. While engineers design new work-systems using optimisation models to identify a best mix of equipment, employees, and procedures for maximum profit, these models rarely account for employee health, and so leave companies vulnerable to 'phantom profits'. This also can make it difficult to justify including ergonomics in design. This study will supplement traditional Operations Research approaches to optimisation in work system design with injury risk models to provide a better estimate of the long term financial performance for a given set of design choices.

INTEGRATING ERGONOMICS INTO PRODUCTION SYSTEM DEVELOPMENT: PROACTIVE MSD PREVENTION (#09036)

Principal Investigator: Patrick W. Neumann (Ryerson University)

Co-Investigators: Saeed Zolfaghari, Filippo A. Salustri (Ryerson University); Marjory Craw-Ivanco, Laura Rourke (University of Waterloo)

Sponsoring Institution: Ryerson University

Three-Year Funding: \$241,290.00

Considering humans in factory design can help ensure that new workplaces are hazard-free right from the first day. Unfortunately, ergonomics is not always applied during the design of new factories. This leads to injured workers and expensive retrofitting of systems to eliminate hazards. In this study, researchers will team up with Research in Motion (RIM) to ensure the inclusion of safety aspects in new factory design processes. Working closely with RIM personnel, researchers will gain a deeper understanding of the challenges facing companies that want to include the human factor alongside traditional production issues in the design of new factories. The research team will assist and coach RIM personnel to achieve innovative production approaches that minimise health risks to employees, while ensuring the competitiveness required to keep production in Canada.

PREVENTION IS THE BEST MEDICINE: DEVELOPING A TOOL TO SHARE INFORMATION ABOUT WORKPLACE RIGHTS, OCCUPATIONAL HEALTH AND SAFETY, AND WORKERS' COMPENSATION WITH NEW IMMIGRANT WORKERS IN ONTARIO (#09101)

Principal Investigator: Agnieszka Kosny (Institute for Work & Health)

Co-Investigators: Peter M. Smith, Ron Saunders, F. Curtis Breslin (Institute for Work & Health)

Sponsoring Institution: Institute for Work & Health

One-Year Funding: \$34,900.00

New immigrants to Ontario have a greater probability of being employed in jobs with a higher number of occupational health and safety hazards. In addition, recent immigrants may have higher risks of work injuries and be less likely to access compensation after injury. Information provided to new immigrants about occupational health and safety or workers' compensation is often informal and fragmented. The goal of this project is to develop an information and training module on workplace rights, occupational health & safety and workers' compensation which could be systematically delivered through settlement agencies and integrated into existing language, job search and employment programs for new immigrants.

BRIDGING THE SAFETY GAP FOR POSTSECONDARY WORKERS (#09104)

Principal Investigator: Cindy L. Hunt (Humber College)

Co-Investigator: F. Curtis Breslin (Institute for Work & Health)

Sponsoring Institution: Humber College

One-Year Funding: \$35,800.00

Working part-time and studying is a normal part of growing up for many teenagers and young adults in Ontario. Within this context, however, young people 15 to 24 years of age are at particularly elevated risk for work-related injury. This study is a collaboration among the Humber College School of Health Sciences, the Institute for Work and Health, and Safe Communities Canada to establish the optimal way of improving occupational health and safety for post-secondary students. The overall aims of the study are to determine the current nature of work and safety training of youth working part time (which has not previously been studied), and to investigate the effectiveness of 'Passport to Safety', an on-line training program provided by Safe Communities Canada and targeted at youth, which has not yet been evaluated in a post-secondary student population.

BREAKTHROUGH CHANGE IN WORKPLACE OHS PERFORMANCE (#09105)

Principal Investigator: Lynda Robson (Institute for Work & Health)

Co-Investigators: Benjamin Amick, Sheilah Hogg-Johnson, Elizabeth Mansfield (Institute for Work & Health); Mark Pagell (York University); Harry Shannon (McMaster University)

Sponsoring Institution: Institute for Work & Health

One-Year Funding: \$57,668.00

This project will address the need of workplaces and their stakeholders to understand better the degree to which large change in a workplace's rate of injury and illness ("breakthrough change") is possible and what factors are critical to making such change (e.g. new technology, senior management commitment, an OHS management system, or worker participation). The research questions are: i) What is the incidence of breakthrough change (BTC) in Ontario firms? ii) What are the critical success factors involved in BTC changes within individual firms? iii) What are the critical success factors common across BTC firms? The first question will be answered through quantitative analyses of the WSIB claims database, coupled with telephone interviews of a random sample of firms that appear from claims statistics to have experienced BTC. The other questions will be answered using case study techniques: data will be systematically collected from select firms through interviews, observations and document review, and will be systematically analyzed. The results of this research will yield the following products: i) description by sector of the incidence of BTC ii) well documented stories of BTC for use in promoting change in workplaces iii) preliminary list of critical success factors for BTC.

RED FLAGS/GREEN LIGHTS: A MULTIPLE STAKEHOLDER EVALUATION OF THE USES OF A RETURN-TO-WORK PROBLEMS GUIDE (#09106)

Principal Investigator: Ellen MacEachen (Institute for Work & Health)

Co-Investigators: Agnieszka Kosny, Elizabeth Mansfield, Keira Keown (Institute for Work & Health)

Sponsoring Institution: Institute for Work & Health

One-Year Funding: \$39,969.25

Return-to-work (RTW) is a complex process and dependent on the coordination of different stakeholders. RTW processes can break down due to poor communication among different parties and system 'blind' spots that leave workers unsupported. In May 2009, Dr MacEachen developed a Guide to help decision makers identify RTW problems and manage them before they escalate. The "Red Flags/Green Lights: A Guide to Identifying and Solving Return-to-Work Problems" is a hands-on product developed from an earlier RAC-funded study of why workers do not return to work as expected. This study will evaluate the implementation process of this Guide among different RTW stakeholders: workplaces, healthcare centres, injured worker support groups, legal clinics, unions, and prevention partners. Stakeholders' practical utilization of the Guide will be tracked for six months through regular interviews. The study will evaluate how the Guide is used, under what circumstances, and for what purposes.

THE RELATIONSHIP BETWEEN COGNITIVE WORK, PHYSICAL WORK, AND THE INITIATION OF MUSCULOSKELETAL FATIGUE DURING SIGN LANGUAGE INTERPRETING: DEVELOPING EVIDENCE-BASED WORK-TO-REST RATIOS (#09108)

Principal Investigator: Kathryn L. Woodcock (Ryerson University)

Co-Investigators: Mohammad Abdoli-Eramaki, Sri Krishnan (Ryerson University); Steven Fischer (University of Waterloo); Debra Russell (University of Alberta)

Sponsoring Institution: Ryerson University

One-Year Funding: \$60,000.00

Musculoskeletal disorders (MSD) present a considerable challenge to sign language interpreters (SLI). The limited research to date has not provided evidence-based exposure limits, and has treated interpreting as a standardized physical task, quantified by duration and speed. Dr Woodcock's previous work, an OHS guide for SLI, proposed a model that reflects the substantial cognitive component of the physical work of interpreting, and was endorsed by the Association of Visual Language Interpreters of Canada (AVLIC). The proposed methodology to measure physical work of SLI incorporates metrics of cognitive and linguistic variables that inherently mediate the physical work of interpretation, and hence play an important part in the development of cumulative musculoskeletal fatigue. This study will collect video work samples and objective measurements in various work-to-rest schedules, develop a model of the physical effects, and make evidence-based work-to-rest recommendations, meeting an immediate need of practicing interpreters. In subsequent studies, cognitive/linguistic variables will be extracted from the videos and integrated into a model to guide the development of interventions, evaluated with the same methodology. This study is a critical first step to bridge the gap between AVLIC's need for more research evidence on the prevention of MSD in SLI.

'SKILLS FOR THE JOB OF RECOVERY': TESTING THE FEASIBILITY OF AN ONLINE PROGRAM FOR DEVELOPING SELF-EFFICACY AND THE SKILLS NEEDED FOR THE JOB OF RETURNING TO OPTIMAL WORK (#09110)

Principal Investigator: Dorcas Beaton (Institute for Work & Health)

Co-Investigators: Peter M. Smith, Dwayne Van Eerd, Carol Kennedy, Ivan Steenstra, Benjamin C. Amick, Ellen MacEachen, William Gnam (Institute for Work & Health); Kenneth Tang (St. Michael's Hospital); Joy C. MacDermid (McMaster University); Robin R. Richards, Iona MacRitchie (Sunnybrook Health Sciences Centre); Kate R. Lorig (Stanford University); Gabrielle van der Velde (University of Toronto)

Sponsoring Institution: Institute for Work & Health

One-Year Funding: \$58,145.50

Injured workers can lack the skills and experience to navigate their way through the potential obstacles to successful return to work. Researchers have described the skills workers need for RTW as having a realistic view of abilities, problem solving skills, maintaining social relationships. But outreach to dispersed workers is challenging. Researchers have found an internet-based support and education program reduced disability and health care utilization by developing some of these same or related skills in back pain patients and chronic diseases. The purpose of this project is to assess the need and feasibility of an online support and education program for developing skills for the job of recovery. This study will use focus groups and survey methods to evaluate the content, internet accessibility and literacy, and receptivity of workers. The project's workplace partners will be the specialty clinics who offer the best access to workers at a later stage in recovery from across the province.

BUDDIES IN TOUGH TIMES: CO-WORKERS' EXPERIENCES OF SUPPORTING INJURED COLLEAGUES' RETURN TO WORK (#09112)

Principal Investigators: Agnieszka Kosny (Institute for Work & Health); Desre M. Kramer (University of Waterloo)

Co-Investigators: Ivan Steenstra (Institute for Work & Health); Richard Wells (University of Waterloo); Carmine Tiano (Building and Construction Trades Council of Ontario); Ed Ryan (Guild Electric Inc.); Kristina Alexanderson (Karolinska Institutet, Sweden)

Sponsoring Institution: Institute for Work & Health

One-Year Funding: \$50,831.00

Co-worker support is important for successful return to work, yet there is little understanding of the challenges that face co-workers when an injured colleague returns to work on modified

or accommodated duties. To better understand these challenges, the study will interview 25 unionized electricians working within the industrial construction sector. The social, organizational and systemic barriers that might work against the creation of a supportive and respectful accommodated work environment will be examined. Co-workers may have a unique perspective on issues that may impact successful RTW, such as the impact of accommodated work on productivity; teamwork and bonuses, the issue of legitimacy of the injury, and sense of (un)fairness or special treatment of injured workers. Interviewees will be asked for solutions to any challenges that they describe. The project has partners in the construction sector and the electrical trades who will be engaged in consultative workshops during the study, and in the targeted dissemination of the findings. The main goals of the project are to create a visual tool that addresses the challenges and rewards of co-worker support for accommodated colleagues and to identify constructs around co-worker support with item-generation for the purpose of developing a questionnaire on co-worker social support.

DEVELOPMENT AND EVALUATION OF A COMPUTER-BASED TRAINING PROGRAM TO PREVENT AND MANAGE MUSCULOSKELETAL INJURIES IN COMPUTER-BASED WORK ENVIRONMENTS (#09116)

Principal Investigator: Benjamin C. Amick (Institute for Work & Health)

Co-Investigators: Betty Dondertman (Centre for Addiction and Mental Health); Michelle Robertson (Liberty Mutual Research Institute for Safety); Lynda Robson, Ivan Steenstra, Dwayne Van Eerd (Institute for Work & Health)

Sponsoring Institution: Institute for Work & Health

One-Year Funding: \$56,680.50

Ontario's growing knowledge and service industries are driven by computing and communication technologies. Consequently, more workers are exposed to computing-based health and safety hazards. Conducting in-person training as a prevention action is time and cost intensive. Computer-based training (CBT) has been shown to be just as effective as in-person training in knowledge transfer/acquisition and changing behaviours. CBTs can be delivered quickly with minimal cost. With changing office work environments, however, it is important for office ergonomic training to be as up-to-date as possible with science and standards (e.g., CSA, ANSI, ISO). The study will: (1) partner with the Centre for Addictions and Mental Health; (2) develop an evidence-based/standard compliant office ergonomics CBT program; and (3) test the program's effectiveness in transferring the knowledge and skills required to reduce musculoskeletal disorder symptoms and injuries. The final product will be an evidence-based/standards-compliant office ergonomics CBT program that can be used by workplace parties in combination with other office ergonomic hazard control methods.

PHYSIOLOGICAL AND PSYCHOLOGICAL STRAIN OF FIREFIGHTERS DURING EMERGENCY RESPONSE SCENARIOS: FIELD VALIDATION OF THE TORONTO HEAT STUDY (#09117)

Principal Investigator: Stephen Cheung (Brock University)

Co-Investigators: Tom McLellan (DRDC-Toronto); Timothy Metcalfe (Toronto Fire Service)

Sponsoring Institution: Brock University

One-Year Funding: \$59,900.00

Traditionally, a firefighter's primary responsibility has been perceived to be to fight fires; however, in actuality, only a small percentage of time is spent on this task. Moreover, in large urban centers, such as Toronto, the bulk of the emergency calls are non-fire related, including emergency medical responses and automotive accidents on major highways. As a result, firefighters are required to wear either partial protective clothing ensembles (such as during a medical call) or full encapsulated with self contained breathing apparatus regardless of the ambient temperature. Although a number of studies have simulated the physiological strain associated with firefighting, limited data exists incorporating the added emotional stress associated with real-life emergency response scenarios. This study will examine the physiological, psychological and biochemical responses in the field during various emergency response scenarios (medical, fire, automobile accident), assessing both individual call responses and the cumulative strain during a firefighter's shift. It will also provide important empirical field data to aid in the development of industry health and safety standards.

USER TRIALS AND POSSIBLE RISKS OF WEARING AN ON-BODY PERSONAL LIFT ASSISTIVE DEVICE (PLAD) (#09118)

Principal Investigator: Joan M. Stevenson (Queen's University)

Co-Investigators: Linda McLean, Patrick Costigan (Queen's University); Mohammad Abdoli-Eramaki (Ryerson University)

Sponsoring Institution: Queen's University

One-Year Funding: \$60,000.00

Before any ergonomic aid is introduced into industry it should meet high standards of performance and user acceptability. These standards should be based on: (i) laboratory proof of effectiveness without added risks, (ii) field trials to confirm user-acceptability, and (iii) clinical trials to demonstrate effectiveness in reducing low back disability. The 'on-body' personal lift assistive device (PLAD) is one such ergonomic aid that reduces the required muscular force needed to lift objects and sustain forward-flexed postures by 15% to 25%. The PLAD contains elastic elements that run nearly parallel to the back muscles and are anchored at the shoulders and feet. When a worker bends or leans forward, some of the energy needed to sustain forward flexion is transferred to the elastic elements resulting in less demand on the back muscles. This study will examine three possible risk factors and conduct extensive field trials with the PLAD: 1) determine if lifting technique is altered by wearing the PLAD; 2) to determine if static forward-flexed postures are altered by wearing the PLAD; 3) determine if dynamic spinal stability is altered by wearing the PLAD and 4) determine user-acceptability of the PLAD across a number of industrial sectors and jobs.

EFFECTIVENESS OF WINTER FOOTWEAR ON VARIOUS SURFACE CONDITIONS FOR USE BY CANADIAN POSTAL WORKERS (#09120)

Principal Investigator: Geoffrey Fernie (Toronto Rehabilitation Institute)

Sponsoring Institution: Toronto Rehabilitation Institute

One-Year Funding: \$55,594.52

During the winter season, postal delivery personnel experience high rates of injury resulting from slip and fall accidents on ice and snow. Proper protective footwear is necessary to reduce the frequency of such accidents. However, efforts by Canada Post to reduce the frequency of slips and falls through educational programs and the provision of crampons (ice cleats) have not yet been successful. There are two major goals for this project. First, through semi-structured interviews the study aims to understand issues related to the use of protective winter footwear by Canada Post delivery personnel. It is known postal workers encounter unpredictable conditions, such as inclines and transitions between slippery and non slip surfaces, on regular routes but it is not known what footwear designs are most effective on such surfaces. In general, winter footwear does not perform optimally on all surface types; e.g. crampons, which dig into ice, provide little grip on concrete. The study's second objective is to determine which types of footwear are most effective on winter surfaces by analyzing natural gait and slip-recovery on inclined, dry, and icy surfaces. Once this is known, effective alternatives for protecting postal workers and develop design criteria for improving winter footwear can be recommended for the future.

IMPLEMENTATION AND ASSESSMENT OF RECOMMENDATIONS FROM WSIB #07120 (OPTIMIZING SEAT SELECTION TO MINIMIZE 6 DOF WHOLE-BODY VIBRATION IN INTEGRATED STEEL MANUFACTURING MOBILE MACHINERY) (#09123)

Principal Investigator: Michele Oliver (University of Guelph)

Co-Investigators: James Dickey (University of Western Ontario); Tammy Eger, Robert Joel Jack (Laurentian University); Patricia Hope (ESSAR Steel Algoma Inc.)

Sponsoring Institution: University of Guelph

One-Year Funding: \$40,000.00

The purpose of this project is to monitor implementation and assess the recommendations emanating from a previously RAC-funded Bridging the Gap project (#07120, "Optimizing Seat Selection to Minimize 6 DOF Whole-Body Vibration in Integrated Steel Manufacturing Mobile Machinery"). The purpose of the previous work was to provide the steel industry with information that would allow them to more efficiently retrofit existing machines which workers report to be particularly uncomfortable to ride in, and which may be related to a number of lost time claim days due to ailments associated with whole-body vibration exposure. Through field-

based data collection, two specific machine types (Pot Haulers and Heavy Lift Transport Vehicles) were identified as needing better seats in order to minimize whole-body vibration levels. A robot was then used to run the field-based vibration for the machine type (Pot Hauler) with the highest seat level vibration in order to test three different heavy equipment seats. Based upon the lab testing, one seat was chosen for implementation in the two specific machine types. Through participatory ergonomics and field-based data collection, this study will evaluate comfort and whole-body vibration levels in machines with the newly installed seats.

HEAT EXPOSURE LIMITS FOR OLDER WORKERS IN DEEP MECHANIZED MINING (#10001)

Principal Investigator: Glen P. Kenny (University of Ottawa)

Co-Investigators: Heather E. Wright, Timothy O. Ramsay, Jane E. Yardley (University of Ottawa); Stephen G. Hardcastle (Natural Resources Canada); Andrew J.E. Seely (The Ottawa Hospital); Michel B. DuCharme (Defence Research & Development Canada)

Sponsoring Institution: University of Ottawa

Three-Year Funding: \$258,411.00

The project focuses on the potential of heat stress to affect negatively workers' health and particularly workers in the mine industry. The researchers are especially interested in the risks associated with heat stress for older workers and those with Type 2 diabetes. The project is an experimental study that would understand and assess the effects of age and Type 2 diabetes mellitus on body heat storage during work in warm environments, with the aim of revising current heat stress management guidelines for the protection of vulnerable mine workers. Study objectives include the evaluation of the effects of age progression on thermoregulatory response, the evaluation of the extent of local- and whole-body heat loss related to the combined effects of age and Type 2 diabetes on the change of body heat content and core temperature, and to assess the effects of clothing and air velocity on exposure time in younger and older individuals.

ANALYZING SAFETY PRACTICES TO MINIMIZE OCCUPATIONAL RADIATION EXPOSURE TO THE CLINICAL INTERVENTIONAL RADIOLOGY TEAM (#10002)

Principal Investigator: Bairbre Connolly (Hospital for Sick Children)

Co-Investigators: Christopher Gordon, Karen Thomas (Hospital for Sick Children)

Sponsoring Institution: Hospital for Sick Children

One-Year Funding: \$29,998.08

This project is a pilot study aimed at determining with greater accuracy low doses of radiation to exposed personnel. The study uses personal monitors (UNFORS EDD30) to measure occupational exposure during fluoroscopy of varying time intervals. This is a clinical simulation; mannequins are used to simulate members of the clinical team that would be exposed in reality. Other than exposure time, effects of distance from source, field size and angle of beam emission will be studied, as well as the effectiveness of presently used protective measures. In addition, live measurements will be taken during actual procedures by placing the personal monitors during fluoroscopically guided interventions. Data analysis will consist of exposure assessment and examination of effects. If appropriate, the results will be applied to larger simulation studies. Plans for knowledge translation (both in-hospital and beyond) are detailed. If appropriate, the results will feed into a regular Occupational Radiation Protection Workshop to be run every two years.

PRE-EXISTING PATIENT FACTORS ASSOCIATED WITH SENSORIMOTOR RECOVERY, CHRONIC PAIN, AND BRAIN PLASTICITY FOLLOWING SURGICAL REPAIR OF PERIPHERAL NERVE INJURIES (#10004)

Principal Investigator: Karen D. Davis (University Health Network)

Co-Investigators: Dimitri J. Anastakis (University Health Network); Joel D. Katz (York University)

Sponsoring Institution: University Health Network

Three-Year Funding: \$348,273.00

This study will assess whether pre-existing patient factors related to personality and pain-related cognitions and structural or functional brain abnormalities are associated with

sensorimotor recovery following surgical repair of an injured upper limb peripheral nerve. Because approximately 50% of such patients have poor recovery after apparently successful surgery to repair the damaged nerve, this is a significant objective that if achieved could produce changes in rehabilitation strategies to account for differences in personality, perception of pain/injury and brain structure/function in subjects who are predicted to have a poor sensorimotor recovery. This objective will be accomplished by administering tests of personality, pain-related cognitions, sensorimotor function in addition to brain imaging assessment of pain perception and structural aspects of the pain perception pathways within two weeks of injury and at 1 year after surgical repair of the damaged nerve. Comparison of subjects showing good recovery with those showing poor recovery will be used to establish whether the measures taken within two weeks of injury can predict likelihood of good versus poor recovery.

UNDERSTANDING THE IMPACT OF THE DECLINE IN UNIONISATION AND IN UNION BARGAINING POWER ON WORKPLACE HEALTH (#10007)

Principal Investigator: Marcia Facey (University of Toronto)

Co-Investigators: Ellen MacEachen (Institute for Work & Health); Anil Verma (Rotman School of Management)

Sponsoring Institution: University of Toronto

One-Year Funding: \$100,000.00

This project is a multiple case study of workplaces to determine the impact of recent trends in labour relations (including unionization), working conditions, and the larger economic environment on workplace health. The study will look at workplaces in different sectors (though focused on the health and public sectors) to see how changes in the contexts of work and unions influence what happens at the bargaining table, and what happens in the workplace and for workers when health and safety matters are considered. Multiple forms of data collection (focus groups, interviews, document analysis, etc.) will be used.

EXAMINATION OF THE TOXICITY OF BLASTING FUMES AS A FUNCTION OF TIME AFTER BLASTING (#10008)

Principal Investigator: Panagiotis Katsabanis (Queen's University)

Sponsoring Institution: Queen's University

One-Year Funding: \$30,000.00

This project is determine whether noxious gases from explosions can accumulate in the broken rock and debris produced by the explosion and continue to contaminate the mine atmosphere for a substantial period following the explosion when the debris is being cleared. In this preliminary work mine explosions will be simulated in the laboratory and gravel will be used to contain the explosion and to act as the muck pile. The experiments are performed on a variety of explosives, particularly ammonium nitrate/fuel oil (ANFO) and a commercial emulsion explosive. Following each explosion, continuous sampling will be conducted for oxides of nitrogen and for carbon monoxide. Experiments will be performed using three different explosives with two different charge diameters and with confinement provided by three different materials. The results will provide information on whether factors affecting gas concentrations and whether reentry times need to be addressed.

AN EXAMINATION OF FRAGILITY FRACTURES THAT OCCUR IN ONTARIO WORKPLACES (#10010)

Principal Investigator: Susan B. Jaglal (University of Toronto)

Co-Investigators: Dircas E. Beaton, Sheilah A. Hogg-Johnson (Institute for Work & Health)

Sponsoring Institution: University of Toronto

One-Year Funding: \$26,159.95

The primary purpose of this study is to determine the incidence and risk of workplace fragility fractures, defined as fractures resulting from a fall from standing height. Little is known about the incidence of fragility fractures, the characteristics of falls and those of workers who are predisposed (e.g., osteoporotic) to injury, or environmental contributing factors. To date, no Canadian study has been done on workplace fragility fractures, which are associated with high level disability and health care costs. Data for incidence will be collected from WSIB Ontario Workers' Compensation Claims database (Phase 1), and risk data for characteristics of workers

and circumstances will be collected from WSIB claim files database for workers (Phase 2). Findings from the study will be used to develop a knowledge translation strategy that would provide a foundation for preventing falls and fragility fractures at work.

OCCUPATIONAL EXPOSURE TO DIESEL AND GASOLINE EMISSIONS AND THE INCIDENCE OF COLORECTAL AND BLADDER CANCER IN CANADIAN MEN (#10011)

Principal Investigator: Shelley A. Harris (Cancer Care Ontario)

Co-Investigators: Paul J. Villeneuve (University of Toronto); Kenneth C. Johnson (Public Health Agency of Canada); Marie-Élise Parent (Institut national de la recherche scientifique)

Sponsoring Institution: Cancer Care Ontario

Two-Year Funding: \$160,880.00

The proposal is to examine the role of (a) diesel engine emissions and (b) gasoline engine emissions in male bladder cancer and male colorectal cancer using data from questionnaires completed between 1994 and 1997, with cases collected from cancer registers across Canada, within 3 months of diagnosis (the National Enhanced Cancer Surveillance System – NECSS). Data from 2038 population-based controls are also available. It is proposed to use job title and industry to assign diesel (and gasoline) exposure estimates to each occupation held for more than 12 months between the ages of 18 years and the interview. Detailed occupational histories will be coded for their probability of exposure and level of exposure to exhaust from diesel or gasoline engines. The resulting exposure score will be compared between cases and controls after adjustment for known risk factors for the cancers.

OHS ECONOMIC EVALUATION RESOURCE NEEDS FOR THE HEALTH CARE SECTOR IN ONTARIO (#10022)

Principal Investigator: Emile Tompa (Institute for Work & Health)

Co-Investigators: Cameron A. Mustard, Benjamin C. Amick III (Institute for Work & Health); Carolyn S. Dewa (Centre for Addiction and Mental Health); Laurel A. Clune (Ryerson University)

Sponsoring Institution: Institute for Work & Health

One-Year Funding: \$29,960.00

How to allocate resources in occupational health and safety is relatively poorly documented, above all in the healthcare sector. Decision makers use only a portion of the data available to them in making OHS-relevant decisions. Institute for Work & Health researchers have been working for several years on developing a tool for conducting economic evaluations of OHS decision making in specific sectors, as well as workshops to train OHS decision makers in economic evaluation skills. Building on this experience, the study will apply this approach in the health sector. The project will chart the decision-making process in the healthcare sector in Ontario, record the information necessary to conduct economic OHS evaluations in the sector, inventorize the data and resources available to organizations, document the requirements and skills needed for OHS decision makers, and finally, for an overarching future project, to develop the tools and training adapted to the economic evaluation needs of OHS decision-making in the targeted sector.

COMPARISON OF THE 1993 EARLY CLAIMANT COHORT AND THE 2005 READINESS FOR RETURN TO WORK COHORT (#10023)

Principal Investigator: Sheilah A. Hogg-Johnson (Institute for Work & Health)

Co-Investigators: David Tolusso, Ivan Steenstra (Institute for Work & Health); Renée-Louise Franche (Occupational Health and Safety Agency for Healthcare in B.C.); Ute Bültmann (University of Groningen)

Sponsoring Institution: Institute for Work & Health

Two-Year Funding: \$120,805.00

This study seeks to evaluate the impact of the 1998 changes in workers' compensation policy in Ontario by comparing two samples of soft-tissue injured workers that were previously collected by the Institute for Work and Health. Both groups participated in follow-up studies conducted by the Institute for Work & Health and so information from those surveys is available for comparison. The outcome variable of interest is the duration of benefit payments, which has been increasing since 1998. They will compare milestones in claims administration

across the two samples, as well as one year and four year claim outcomes to determine differences between the two cohorts and, using a wide variety of causative and control variables, possible causes of these differences.

FIRM SELECTION ALGORITHMS: COMPARISONS OVER TIME (#10024)

Principal Investigator: Sheilah A. Hogg-Johnson (Institute for Work & Health)

Co-Investigators: Benjamin C. Amick III, Donald C. Cole, Cameron A. Mustard, Lynda S. Robson, Peter M. Smith, Emile Tompa, Dwayne Van Eerd (Institute for Work & Health)

Sponsoring Institution: Institute for Work & Health

One-Year Funding: \$72,650.00

This project will select, from WSIB data, three groups (cohorts) of firms based on three different statistical firm selection algorithms. The statistical algorithms will be applied to data from a reference period prior to their high-risk selection for targeted intervention. The investigators will then check whether the three algorithms in fact end up selecting the same firms, and whether the selected cohorts behave differently to targeted intervention. Such a project will be useful in improving the targeting and selection of firms for intervention purposes and in the evaluation of the impact of those interventions.

MAKING THE LINK BETWEEN EXPOSURE AND RESPIRATORY CANCER IN THE CLINICAL SETTING: WHAT ARE THE STEPS? (#10026)

Principal Investigators: D. Linn Holness (St. Michael's Hospital); Loraine Maret (Cancer Care Ontario)

Co-Investigators: Irena Kudla (St. Michael's Hospital); John Oudyk (Occupational Health Clinics for Ontario Workers); Karin Hohenadel (Cancer Care Ontario)

Sponsoring Institution: St. Michael's Hospital

One-Year Funding: \$29,980.00

This study will assess the feasibility of an intervention study aimed at improving occupational history taking by clinicians engaged in the management of persons with lung cancer (men and women) or pleural mesothelioma (men only). The ultimate goal is to improve identification of persons with occupation-related cancers who may be eligible for workers' compensation. Before undertaking an intervention study, the researchers need to develop and test procedures for (i) identifying occupational asbestos exposure among persons with the target cancers, (ii) determining if those persons with such exposure want assistance to assess their exposure and eligibility for compensation, and, (iii) providing such assistance to those who want it.

DEVELOPING AN INTERVENTION TO REDUCE OCCUPATIONAL HEALTH AND SAFETY RISK AMONG VULNERABLE WORKERS: PICTOGRAMS AND TRAINING FOR LOW-LITERACY HOTEL/MOTEL WORKERS (#10027)

Principal Investigator: Benjamin C. Amick III (Institute for Work & Health)

Co-Investigators: F. Curtis Breslin, Lynda S. Robson, Kiera Keown, Ivan A. Steenstra, Dwayne Van Eerd (Institute for Work & Health); Michelle M. Robertson (Libert Mutual Research Institute for Safety)

Sponsoring Institution: Institute for Work & Health

One-Year Funding: \$29,760.00

This developmental project will determine the feasibility of an intervention program aimed at workers for whom English is a second language and/or who have low literacy in order to prevent work-related musculoskeletal disorders. The intervention consists of pictograms combined with management and worker training appropriate to this worker group. The applicants also want to develop appropriate tools to measure the outcomes of the intervention; these tools will involve both subjective and objective evaluation of the workers. Once the feasibility of the program components is established, the applicants plan to run a randomized field trial of clusters of hotels and motels and this will require development of stakeholder collaborations.

**DEVELOPING LEADING INDICATORS FROM OHS MANAGEMENT AUDIT DATA
(#10029)**

Principal Investigator: Lynda S. Robson (Institute for Work & Health)

Co-Investigators: Sheilah A. Hogg-Johnson, Benjamin C. Amick III, Ivan A Steenstra, Dwayne Van Eerd (Institute for Work & Health)

Sponsoring Institution: Institute for Work & Health

Two-Year Funding: \$86,800.00

The first aim of this study is to determine, from historical data, whether or not the 122 item WSIB audit instrument has statistical clustering of items (factors), which would indicate possible metrics. The second is to determine if the audit metrics predict future firm claim experience. Finally, based on these results, recommendations can be made concerning possible shortening of the audit instrument. Since the historical data exist, the bulk of the work is statistical analysis, supported by expert analysis and judgement. Experts with field experience in OHS management (e.g., auditors, consultants) will be consulted at two points during the analyses, so that their opinions can help guide the analytical course.

**IS HOSPITAL-BASED HEALTHCARE A RISK FACTOR FOR INFLUENZA INFECTION IN
CANADIAN ADULTS? (#10031)**

Principal Investigator: Allison J. McGeer (Mount Sinai Hospital)

Co-Investigators: Brenda L. Coleman, Bjug Borgundvaag, Karen Green, Donald E. Low, Christine Moore, Leslie Vincent (Mount Sinai Hospital); Stewen Drews (University of Calgary); Leon Genesove (Ontario Ministry of Labour); D. Linn Holness, Matthew P. Muller (St. Michael's Hospital); Kevin C. Katz (North York General Hospital); Jeffrey C. Kwong (Institute for Clinical Evaluative Sciences); Joanne Langley (Canadian Center for Vaccinology, IWK Health Centre, and Dalhousie University); Mark B. Loeb (McMaster University); Shelly A. MacNeil (QEII Health Sciences Centre); Kathryn A. Nichol (Health and Safety Association for Government Services); Janet A. Raboud (University Health Network); Andrew Simor (Sunnybrook Health Sciences Centre); John D. Oudyk (Occupational Health Clinics for Ontario Workers)

Sponsoring Institution: Mount Sinai Hospital

Three-Year Funding: \$450,000.00

This study aims to assess whether hospital based health care workers (HCW) are more at risk of developing influenza than other healthy adults and, within HCW, whether those who work with patients with acute respiratory infections, or whose work generates aerosols are at greater risk than other hospital based HCW. The researchers plan to answer these questions by recruiting volunteers from a number of large health care institutions, asking them to complete weekly on-line reports during 3 consecutive flu seasons and to collect and drop-off/mail nasal swabs when they are unwell. They aim to recruit 420 HCW and 105 non-HCW (office workers) in flu season 1, 500 HCW and 125 non-HCW in year 2 and a further 500 HCW in year 3. They will compare the proportions developing laboratory confirmed symptomatic influenza in health care and other workers, and, within healthcare workers, by work (or not) in a high risk area. Both those with and without influenza vaccination in the year of the study will be eligible.

**MILD TO MODERATE WORK-RELATED TRAUMATIC BRAIN INJURY: A PILOT STUDY
(#10034)**

Principal Investigator: Angela Colantonio (University of Toronto)

Co-Investigators: Bonnie Kirsh (University of Toronto); John Lewko (Laurentian University); Mark Bayley, Deborah Hebert, Angela M. Carter (Toronto Rehabilitation Institute); Vicki L. Kristman, J. David Cassidy (University Health Network)

Sponsoring Institution: University of Toronto

One-Year Funding: \$29,500.00

The results of this pilot study aim to provide the basis for a full research project for which this development grant is needed. The research proposal focus on the factors that helps or not the return to work for workers who have sustained a mild to moderate work-related traumatic brain injury and on the re-injury for those who have successfully returned to work after such traumatic brain injury. The research objectives are to compare the patient profile of workers with a successful return to work with the profile of those who did not return to work, then to identify facilitators or barriers to successful return to work, and finally to determine the rate,

nature and contributing factors of re-injury. At least 50 workers will be recruited within a retrospective cohort design to answer a 30-minute questionnaire that will be administered by telephone. The questionnaire will include a variety of elements related to individual as well as occupational variables associated with return to work and re-injury. Bivariate and multivariate as well as qualitative analyses will be conducted. The results can be used to improve rehabilitation of work-related traumatic brain injury and re-injury prevention strategies.

OPERATIONS RESEARCH MODELLING OF THE ECONOMIC IMPACT OF OHS IN OPERATIONS SYSTEMS (#10035)

Principal Investigator: Mohamed Wahab Mohamed Ismail (Ryerson University)

Co-Investigators: W. Patrick Neumann, Ahmad Sobhani (Ryerson University); Linda M.O. Rose (The Royal Institute of Technology [Sweden])

Sponsoring Institution: Ryerson University

Three-Year Funding: \$92,397.00

Poor workplace health and safety leads to 'phantom profits' for companies – where expected financial performance vanishes due to untracked impacts of poor human factors and safety performance. While engineers design new work-systems using optimisation models to identify a best mix of equipment, employees, and procedures for maximum profit; these models rarely account for employee health, making proactive prevention difficult. This project aims to fix this problem by integrating health & safety considerations into mathematical models that predict the performance of a workplace. Researchers will collaborate with partners in both hospital and manufacturing sectors to customise and test a novel performance modelling approach that includes safety aspects. These models will use traditional operations research mathematical modelling approaches to predict injury rates, performance impacts, and even errors and quality problems, over the entire life-span of a given workplace. Unlike existing OHS-economic approaches that focus on the workstation level, these models will focus on performance and risk of whole work-systems.

HEALTH RISKS AMONG NUCLEAR WORKERS IN ONTARIO WHO HAVE BEEN EXPOSED TO INTERNAL SOURCES OF IONIZING RADIATION: A FEASIBILITY STUDY (#10037)

Principal Investigator: Loraine D. Marrett (Cancer Care Ontario); Minh T. Do (Center for Research in Environmental Epidemiology)

Co-Investigators: Elisabeth Cardins (Center for Research in Environmental Epidemiology); John R. McLaughlin (Cancer Care Ontario)

Sponsoring Institution: Cancer Care Ontario

One-Year Funding: \$28,825.00

This study aims to assess the feasibility of conducting a full scale epidemiologic study to quantify the health risks of nuclear workers in Ontario who are exposed to internal ionizing radiation. The availability and quality of data including the enumeration and identification of eligible workers, the accuracy of estimated internal radiation doses, and information on potential confounding variables will be investigated through discussions with important stakeholders and an examination of a sample of employment records. The results of the study will determine the design, subject enrollment methods, estimated internal radiation doses, sample size, and budget requirement of the full study.

AN EVALUATION OF HEXAVALENT CHROMIUM EXPOSURE IN ONTARIO WELDING AND STEEL INDUSTRIES, INCLUDING SIZE SELECTIVE AIRBORNE EXPOSURES (#10104)

Principal Investigator: Brian E. McCarry (McMaster University)

Co-Investigators: Lorraine Shaw, Dave K. Verma (McMaster University); Jan Kasperski (Ontario College of Physicians)

Sponsoring Institution: McMaster University

One-Year Funding: \$58,400.00

Thousands of workers in Ontario are exposed to hexavalent chromium or Cr(VI) to varying degrees in industrial settings including steel mills, welding shops, electroplating and painting industries. Adverse health effects associated with inhalation of Cr(VI) include lung cancer and non-malignant respiratory effects, asthma and bronchitis. Currently, "total dust" samples are collected to measure Cr(VI) exposures, but "total dust" samplers do not capture particle sizes

greater than 30-40 microns in mean diameter, which are believed to contribute to non-malignant respiratory effects. A more appropriate sampling method for Cr(VI) exposure is to collect particles up to 100 microns in diameter using an inhalable sampler. The goal of this study is to determine workplace Cr(VI) exposures by collecting size-selective samples and to identify the most appropriate sample collection technique. The particle size distribution and the Cr(VI) contents of dusts and aerosols will be determined in the steelmaking and welding industries.

ADAPTATION OF A NOVEL SHOULDER EXPOSURE ANALYSIS TOOL FOR USE BY PRACTICING ERGONOMISTS (#10107)

Principal Investigator: Clark R. Dickerson (University of Waterloo)

Co-Investigators: Jack P. Callaghan (University of Waterloo)

Sponsoring Institution: University of Waterloo

One-Year Funding: \$37,450.00

This study will convert an existing novel shoulder joint musculoskeletal exposure analysis tool to a widely distributed, freely available ergonomic assessment tool across Ontario workplaces. Although the current form of the tool has a firm scientific foundation, it requires biomechanics and research expertise to use. The end product will be a broadly disseminated, ergonomist-assessed, cutting-edge, validated shoulder analysis package. It will include detailed training materials and will be made available to all interested WSIB stakeholders, including practicing ergonomists, health and safety professionals, and health and safety associations and their members. This should provide the ability to distinguish between task demands in terms of shoulder exposures, which is highly desired by ergonomics professionals. No equivalent tool exists at present, leaving ergonomists with difficult and often impossible problems when designing or modifying work.

ADDRESSING BARRIERS IN ACCESS TO HEALTH AND WORKERS' COMPENSATION SERVICES FOR MIGRANT FARM WORKERS (#10108)

Principal Investigator: Janet E. McLaughlin, Jenna L. Hennebry (Wilfrid Laurier University)

Co-Investigators: Donald C. Cole (Institute for Work & Health); Michael Pysklywec, Ted Haines (McMaster University)

Sponsoring Institution: Wilfrid Laurier University

One-Year Funding: \$40,000.00

A growing number of temporary foreign workers come to work each year in Ontario's agricultural industry, a relatively high risk industry in which occupational health and safety problems can be common, and may go unreported. A growing body of research in the U.S. and Canada indicates these workers face many barriers to accessing health care and insurance, social and physical isolation, and fear of loss of employment or forced return to their country of origin. Building on current research findings, this project will develop research-based educational initiatives that describe these barriers to health care and service providers, and facilitate collaborative identification of strategies to increase these workers' access to health care services and WSIB. Resource packages with printed and on-line materials, educational sessions in rural Ontario communities, and a stakeholder workshop to discuss strategies to improve access, will be targeted to health care providers and representatives of other institutional stakeholders that deal with these workers, such as the WSIB and consular officials.

MAINTAINING COMPETENCY IN MANAGING DEMENTIA-RELATED AGGRESSION USING AN ACTIVITY-BASED EDUCATIONAL APPROACH IN LONG TERM CARE (#10114)

Principal Investigator: Lori J. Schindel-Martin (Ryerson University)

Co-Investigators: Kevin Brazil, Diane Crawshaw (McMaster University); Jennifer Banks (St. Joseph's Villa); Barbara McCoy (Alzheimer Society of Hamilton and Halton); Nellie Vengeroff (Ryerson University)

Sponsoring Institution: Ryerson University

One-Year Funding: \$59,928.20

This pilot study tests a refresher dose for a full 7.5 hour version of an educational program about managing dementia-related aggression in long-term care (LTC). The study will test two

50-minute refresher sessions that review key program principles. The refresher will be implemented in a non-profit LTC home where some staff receive the review, and others will not. Staff will be asked to complete a short questionnaire measuring confidence to manage aggression four times over a 3 month period. Questionnaires, focus groups and end-of-shift reports will ask about experiences with aggression. Employees who receive a refresher dose are anticipated to have a stronger sense of confidence and report greater success in the management of aggression that occurs. It is also anticipated that staff in the refresher groups will report fewer overall incidents of aggression during daily care activities with residents. Based on the results from this study, the research team will be able to investigate the effectiveness of on-line modules in a larger sample of facilities across Ontario. This is particularly important for staff in isolated communities.

INTERVENTIONS MEDIATING HEALTH RISKS AMONG SHIFT WORKERS: CURRENT KNOWLEDGE AND WORKPLACE PRACTICES (#10115)

Principal Investigator: Paul Demers (Occupational Cancer Research Centre)

Co-Investigators: Cameron A. Mustard (Institute for Work & Health); Kristan Aronson (Queen's University)

Sponsoring Institution: Cancer Care Ontario

One-Year Funding: \$52,250.00

There is a need to evaluate the interventions currently in use to mediate the potential risks of injury and disease among shift workers. This would require input from workers, unions, employers and policy makers in addition to researchers in order to develop a comprehensive picture of current knowledge and workplace practices for the prevention of injury and disease related to shift work. The aim of this proposal is to build a team of collaborators with experience in the area from a variety of vantage points including research, policy, labour and management; conduct a knowledge and needs assessment and develop a comprehensive issue briefing on current workplace practices, proposed interventions, and knowledge gaps; and organize a second symposium on the health effects of shift work with a focus on interventions.

ECONOMIC EVALUATION OF HEALTH AND SAFETY PROGRAMS: A TRAINING WORKSHOP FOR WORKPLACE PARTIES (#10116)

Principal Investigator: Emile Tompa (Institute for Work & Health)

Co-Investigators: Kim Grant, Krian Kapoor (Workplace Safety & Prevention Services); Lynda S. Robson, Kiera Keown, Emma Irvin (Institute for Work & Health)

Sponsoring Institution: Institute for Work & Health

One-Year Funding: \$59,974.00

This project will develop and deliver a training workshop for workplace parties—managers, labour representatives, and health and safety (H&S) practitioners—on economic evaluation methods for H&S initiatives. The workshop objectives are to increase awareness of the need to consider the cost and consequences of H&S initiatives, systematically, comprehensively, and on an ongoing basis; to advance knowledge about sound economic evaluation methods for H&S initiatives; to increase the comfort level and ability to apply economic evaluation methods in workplaces; and to stimulate dialogue and discussion, in workshop breakout sessions, about overcoming barriers to undertaking in-house H&S economic evaluations. To develop the workshop content the project will undertake in-depth interviews with workplace parties for insights into the H&S decisions they confront, the challenges they face when making decisions, the analyses they currently do, and the information resources they currently access to assist with decisions.

MAKING PARTICIPATION WORK IN THE NEW ECONOMY (#10117)

Principal Investigator: Alan Hall (University of Windsor)

Co-Investigators: Wayne Lewchuk (McMaster University); Syed Naqvi, John Oudyk (Occupational Health Clinics for Ontario Workers); Andrew King (United Steelworkers)

Sponsoring Institution: University of Windsor

One-Year Funding: \$59,876.00

This project will engage worker OHS representatives, practitioners, and researchers in a collaborative process to improve the effectiveness of worker OHS representation. A foundation of

the Ontario internal responsibility system, worker OHS representation today faces a number of challenges to its effectiveness. At the same time, valid tools such as management safety systems, mapping, participatory ergonomics, and internal air quality and stress surveys have been developed to diagnose more effectively health and safety problems at work. Drawing on in-depth interviews with workplace parties, the project will seek to identify the skills, knowledge, and tools that worker OHS representatives have used effectively to achieve OHS improvements. The data will be compiled and analyzed to produce a status guide to improving worker OHS representation. The guide will in turn be used to develop future collaborations with worker OHS representatives, employers, prevention associations, and inspectors on topics identified in the status guide.

IMPROVED METHODS FOR WORK INJURY SURVEILLANCE IN ONTARIO (#11004)

Principal Investigator: Cameron A. Mustard (Institute for Work & Health)

Co-Investigators: Peter M. Smith, Ron Saunders (Institute for Work & Health); Christopher McLeod (University of British Columbia)

Sponsoring Institution: Institute for Work & Health

Two-Year Funding: \$170,140.00

Shift work – employment with anything other than a regular daytime work schedule — is a large part of work in the Canadian economy. About 25% of full-time workers aged 19-64 in Canada worked shifts in 2005. There is particularly strong evidence that night, evening, rotating and irregular shifts are associated with an elevated risk of occupational injury. In Ontario, there is currently no adequate method for monitoring the differences in work injury risk according to the time period of work. This project will address this gap in occupational health surveillance capacity by developing methods to estimate the association between the rate of work-related injury and time of injury for labour force participants in Ontario for the period 2004-2008. The study methods will support the description of differences between occupations and industries in the risk of work injuries over the 24 hour clock. This information can be a foundation for the identification of potential prevention efforts and will inform the design of more sophisticated etiologic research to understand the specific mechanisms of hazards associated with non-regular work hours.

METHODS FOR THE MEASUREMENT OF OCCUPATIONAL NOISE EXPOSURE FROM COMMUNICATION HEADSETS (#11009)

Principal Investigator: Christian Giguere (University of Ottawa)

Co-Investigators: Hilmi R. Dajani (University of Ottawa)

Sponsoring Institution: University of Ottawa

Three-Year Funding: \$157,583.00

Communication headsets are now being used in a growing number of workplaces and occupations (law-enforcement, construction industry, phone operators, retail and fast food outlets, etc.). These headsets can lead to high levels of noise exposure from both the signal coming from the headset and the surrounding background noise. Noise-induced hearing loss is one of the most common work-related illnesses that causes problems, not only for the individuals involved, but also for their families and co-workers. Although several national and international standards describe procedures for the measurement of occupational noise exposure when sound sources are far from the workers' ears, these approaches are not suitable for sound sources close to or covering the ear. Several approaches for measuring noise exposure from headsets have been proposed, but they are difficult to implement in practice as they require complex and costly acoustic equipment. Recently, as part of a working group of the Canadian Standards Association, the applicants have proposed a new, simplified method for measuring noise exposure from communication headsets that requires basic sound level measurements. The purpose of the proposed project is to refine this method, and validate it in the field against specialized measurement methods at selected workplaces.

INCORPORATING MUSCULOSKELETAL DISORDER PREVENTION INTO HEALTH AND SAFETY MANAGEMENT AND INTEGRATED MANAGEMENT SYSTEMS (#11010)

Principal Investigator: Richard P. Wells (University of Waterloo)

Co-Investigators: Philip L. Bigelow, Nancy M. Theberge (University of Waterloo); Daniel Imbeau (École Polytechnique Montréal); Patrick W. Neumann (Ryerson University); Mark D. Pagell (York University)

Sponsoring Institution: University of Waterloo

Three-Year Funding: \$172,056.00

Company management systems use systematic models and techniques to prevent injuries, occupational disease and fatalities in the workplace. Strains and sprains, low back pain — known as musculoskeletal disorders (MSDs) — are major personal and financial concerns in Ontario. Unfortunately, ergonomic techniques to assess hazards for MSDs do not fit easily into the methods used for planning and decision making within a company's management systems. Integrating MSD prevention tools into a company's management system will help prevent MSDs by using companies' everyday tools and getting MSD hazards 'on the table' during decision making. The project will explore current approaches and techniques used by companies to address general health safety hazards compared to methods used for MSD hazards. It will do this through interviews with multiple stakeholders within multiple workplaces and sectors. It will then develop approaches to assess, eliminate, and control MSD hazards within a company's management system. A follow-up study will evaluate the feasibility and usefulness of the approach. The expected outcome of the project is a guide to help companies better integrate MSD prevention into their management systems.

EVALUATION OF A WORKPLACE-LEVEL MSD-PREVENTION KNOWLEDGE TRANSFER INTERVENTION, AND THE CREATION OF AN ON-LINE MSD PREVENTION PLANNING TOOL (#11013)

Principal Investigator: Desre M. Kramer (University of Waterloo)

Co-Investigators: Phil L. Bigelow, Richard P. Wells (University of Waterloo); Theresa L. Aversa (Ontario Public Services Employees Union); Keith L. McMillan (Communication, Energy and Paperworkers Union of Canada, Ontario Region); Syed Naqvi (Occupational Health Clinics for Ontario Workers); Ivan Steenstra, Dwayne Van Eerd (Institute for Work & Health)

Sponsoring Institution: University of Waterloo

Two-Year Funding: \$134,292.00

Workplace-level tools are important mechanisms to assist joint health and safety committees (JHSCs). However, there is no standard approach to evaluating workplace knowledge-transfer interventions to see whether these tools result in workplace change. To understand these challenges better, the project aims to develop, with the help of stakeholders, a theory-based evaluation of the impact of a workplace physical-loads questionnaire (validated in an earlier RAC-funded pilot study, #09019). Sixty JHSC co-chairs at multi-sector companies will be interviewed to examine factors which affected the questionnaire's use as a change tool. The project is a collaborative, participatory action research project with a transdisciplinary team of researchers, six unions, and the Occupational Health Clinics for Ontario Workers. The physical loads questionnaire will be converted to a web-based validated questionnaire and made widely available for workplace parties to prevent injuries.

ASSESSING THE FEASIBILITY OF DEVELOPING, IMPLEMENTING, AND EVALUATING AN OCCUPATIONAL HEALTH AND SAFETY TRAINING PROGRAM THAT WOULD EMBED CURRICULUM FOR ENHANCING LITERACY AND OTHER ESSENTIAL SKILLS (#11014)

Principal Investigator: Ron Saunders (Institute for Work & Health)

Co-Investigators: Karen Myers (Social Research and Demonstration Corporation); Lynda Robson, Curtis Breslin (Institute for Work & Health)

Sponsoring Institution: Institute for Work & Health

One-Year Funding: \$29,100.00

This project would examine how to develop, implement, and evaluate a training program that would improve literacy and other basic skills as part of occupational health and safety training. There is, however, little research on whether adding literacy curriculum to OHS training would make it more effective. The study would look at existing OHS training programs, consult on how to add a basic skills component, and assess whether the new program could be put in

place and evaluated. The key steps of the project are: (1) consult with health and safety associations, literacy trainers, and labour and employer organizations to identify an industry and set of occupations with a high risk of injury and a gap between the average literacy levels of the workforce and the skill needs of the job; (2) consult with OHS and literacy training providers to determine how OHS training programs in this industry could be changed to improve literacy and other basic skills; (3) outline a proposed new program and obtain advice on how well it could work; (4) identify employers who would be willing to help assess the new program; (5) outline how the new program could be evaluated; (6) assess the feasibility of implementing and evaluating the new program; (7) depending on the results of step 6, develop a budget, timeline, and plan for implementing and evaluating the new program.

BEYOND SILENCE: DEVELOPING PEER EDUCATION AS AN EARLY INTERVENTION STRATEGY FOR HEALTHCARE WORKERS WITH MENTAL ILL-HEALTH (#11022)
Principal Investigator: Sandra Moll (McMaster University)

Co-Investigators: Rachel Thibeault (University of Ottawa); Susan Jakobson (Mary Ann Baynton and Associates)

Sponsoring Institution: McMaster University

One-Year Funding: \$30,000.00

Mental ill-health among Ontario healthcare workers is a growing concern, accounting for up to one-third of all short-term and long-term disability claims, and almost 70% of the total disability costs. Presenteeism is also a significant issue; working despite mental illness can compromise the health and safety of workers, their colleagues, and their patients. Despite the prevalence and impact of mental ill health among healthcare workers, their issues are often surrounded by secrecy, stigma, and silence. Early identification and support to overcome the silence is critical to prevent psychosocial disability and facilitate opportunities for treatment and recovery. Contact-based education, involving individuals with lived experience of mental ill-health reduces barriers related to stigma and silence. The purpose of this project is to develop and evaluate a peer-led education program to facilitate early identification of mental ill-health among healthcare workers. Key stakeholders in a large urban hospital will be engaged in the process of program development, identifying supports and barriers, and developing a protocol for implementation and evaluation. Interviews and focus groups will be conducted, and the receptivity and resources required for implementation will be assessed in order to determine feasibility for the next phase of implementation and systematic evaluation.

OCCUPATIONAL CANCER SURVEILLANCE USING THE 1991-2006 CANADIAN CENSUS MORTALITY & CANCER COHORT (#11024)

Principal Investigator: Paul Demers (Occupational Cancer Research Centre)

Co-Investigators: M. Anne Harris (Cancer Care Ontario)

Sponsoring Institution: Cancer Care Ontario

Three-Year Funding: \$312,570.00

There are approximately 60 well-established workplace carcinogens. However, there are many more industrial chemicals and other agents that are suspected to cause cancer, and still more that have never been studied. Currently, Canada lacks any rapid means to assess whether there is an increased risk associated with an exposure or what the risk of cancer is among people with the same job or working in the same industry. The major challenge is that, although Canada collects very good information on every new cancer that is diagnosed, there is no way to identify where these patients worked. Recently, Statistics Canada linked data from the 1991 long form Census to the Canadian Cancer Registry, a national database created with data from all the provincial and territorial tumour registries. The resulting database includes 2.7 million people. The study will analyze this database to identify whether there is an increased risk of cancer associated with suspected carcinogens. It will also conduct a series of analyses to see whether some groups of people with the same job or in the same industry have an increased risk. These analyses will contribute to the recognition of causes of cancer that can then be targeted for prevention efforts.

SURVEILLANCE OF OCCUPATIONAL CANCER RISKS THROUGH LINKAGE OF WSIB CLAIMS TO THE ONTARIO CANCER REGISTRY: A PILOT STUDY (#11025)

Principal Investigator: Paul Demers (Occupational Cancer Research Centre)

Co-Investigators: M. Anne Harris (Cancer Care Ontario); Mieke Koehoorn, Christopher McLeod (University of British Columbia)

Sponsoring Institution: Cancer Care Ontario

One-Year Funding: \$29,800.00

There are approximately 60 well-established workplace carcinogens. However, there are many more industrial chemicals and other agents that are suspected to cause cancer, and still more that have never been studied. Currently, Canada lacks any rapid means to assess whether there is an increased risk associated with an exposure or what the risk of cancer is among people with the same job or working in the same industry. The major challenge is that, although Canada collects very good information on every new cancer that is diagnosed, there is no way to identify where these patients worked. The goal of this project is to test a new way to monitor and measure workplace risk factors for cancer. When workers make claims to the WSIB for time lost, their claims contain information on their occupations and industries. These claims can be linked to records of cancer diagnoses held by Cancer Care Ontario to compare risks of cancer for different occupations and industries. This project will adapt methods developed by researchers in Alberta and British Columbia and test how well linking the records will work in Ontario.

FURTHER EXPLORATION OF BREAKTHROUGH CHANGES IN OHS PERFORMANCE (#11030)

Principal Investigator: Lynda S. Robson (Institute for Work & Health)

Co-Investigators: Benjamin C. Amick III, Sheilah Hogg-Johnson, Liz Mansfield, Emile Tompa (Institute for Work & Health); Mark Pagell (York University); Harry S. Shannon (McMaster University)

Sponsoring Institution: Institute for Work & Health

Two-Year Funding: \$180,360.00

The main objective of this proposal is to understand why and how workplaces undergo large improvement in occupational safety. Three plants of a manufacturing company will be compared. The plant in Ontario showed a large decrease in its total injury rate over the previous decade. The plant in Texas showed a smaller decline in injury rate over the same period, while the plant in Alberta did not show any change. These differences in injury patterns are surprising because the three plants have similar processes, are of similar size (75-100 FTE), and have the same corporate health and safety administration. This project seeks to understand how these differences between plants came about. Multiple sources of data from the three plants will be used in the analyses. These include interviews, a work site tour, reviewing documents, observing new employees, surveying employees and company administrative data. This work builds on another RAC-funded project, "Breakthrough Change in Workplace OHS Performance" (#09105).

VALIDATION OF AN ONTARIO PREVENTION SYSTEM LEADING INDICATOR (#11031)
Principal Investigators: Benjamin C. Amick III, Lynda S. Robson (Institute for Work & Health)

Co-Investigators: Peter M. Smith, Sheilah Hogg-Johnson, Dwayne Van Eerd (Institute for Work & Health)

Sponsoring Institution: Institute for Work & Health

Three-Year Funding: \$249,982.00

In 2008, all Ontario prevention system partners (HSAs, MOL, WSIB, IWH) developed and piloted 8 questions to assess quickly an organization's occupational health and safety performance. Using the 8 questions an organizational performance metric (OPM) was developed. In pilot work, the OPM predicted an employer's injury and illness claims rate in the last 4 years. The best employers, as rated by the OPM, had the lowest claim rates and the poorest performers the highest. The proposed research builds the scientific evidence base for the OPM tool by answering methodological and practical questions raised in the pilot work by stakeholders. Does the OPM tool predict future claim rates? If an organization's claim rates change signifi-

cantly over time, do the organization's answers to the 8 questions reflect the changes? Does it matter how you collect the information (e.g., in person, by phone, in meetings, or over the internet)? What are health and safety professionals thinking when they answer the questions? Are the answers to the 8 questions representative of what is going on in the organization? How can the tool be used in practice? The research contributes to the growing scientific study of leading indicators of OHS prevention system and workplace performance.

EARLY OPIOID PRESCRIPTIONS FOR WORK-RELATED MUSCULOSKELETAL DISORDERS OF THE LOW BACK: UNDERSTANDING UTILIZATION PATTERNS, DETERMINANTS, AND IMPACT ON WORK DISABILITY (#11032)

Principal Investigator: Sheilah A. Hogg-Johnson (Institute for Work & Health)

Co-Investigators: Nancy Carnide, Andrea Furlan (Institute for Work & Health); Pierre Côté (Toronto Western Research Institute); Mieke Koehoorn (University of British Columbia)

Sponsoring Institution: Institute for Work & Health

Two-Year Funding: \$64,009.00

Increasing use of prescription opioids for musculoskeletal disorders is a major concern for workers' compensation insurers, including the WSIB. Recent studies suggest opioids are being provided to claimants increasingly earlier and these early prescriptions lead to prolonged work disability. However, methodological limitations of these studies cast doubt on the accuracy of conclusions. The objective of this study is to address the limitations of previous studies and determine whether opioids prescribed within eight weeks of a new lost-time low back pain claim are associated with work disability. To inform this objective, the study will also examine patterns of health care received two years before claim and patterns of opioid prescriptions one year post-claim and their associated factors. The study will conduct analyses using data on workers' compensation benefits, health care utilization, and prescriptions. Study findings will provide a comprehensive picture of opioid prescribing patterns among claimants and their impact on work.

WORK INJURY AND POVERTY: INVESTIGATING PREVALENCE ACROSS PROGRAMS AND OVER TIME (#11034)

Principal Investigator: Emile Tompa (Institute for Work & Health)

Co-Investigators: Heather Scott-Marshall, Ron Saunders, Sheilah Hogg-Johnson (Institute for Work & Health); Peri J. Ballantyne (Trent University)

Sponsoring Institution: Institute for Work & Health

Two-Year Funding: \$88,160.00

Research on the economic impact of work disability has found that permanently impaired workers have reduced labour-market earnings, suffer significant long-term financial losses, and are at increased risk of poverty. There is also some preliminary evidence that suggests the proportion of impoverished claimants is rising, though little is known about the specific factors that contribute to poverty and the reasons for its possible increase. One explanation might be that key changes in labour-market contracting practices (e.g., increased use of contingent labour) have made it more difficult for permanently impaired workers to maintain paid employment. Another possibility is that changes in the workers' compensation legislation and policy have eroded the support structures that facilitate labour-market reentry and/or have reduced access to adequate benefits. This study will investigate the prevalence of poverty in claimants across different time periods and different legislative programs using a large representative sample created through a data linkage. It will also investigate how program type, time period, and other individual and contextual factors affect the probability of poverty. Such knowledge is essential to developing policies and programs that support improved outcomes for permanently impaired workers — e.g., via better targeting of financial assistance measures and labour-market re-entry support.

EXAMINING INDIVIDUAL AND WORKPLACE FACTORS WHICH DIFFERENTIATE INJURIES THAT RESULT IN WAGE REPLACEMENT FROM THOSE THAT DO NOT (#11035)

Principal Investigator: Peter M. Smith (Institute for Work & Health)

Co-Investigators: Cameron A. Mustard, Sheilah Hogg-Johnson, Emile Tompa (Institute for Work & Health)

Sponsoring Institution: Institute for Work & Health

One-Year Funding: \$60,450.00

Whether an injury results in time off work or not has important implications in Ontario. Recent reports have suggested that differences between lost-time claims (LTCs) and no-lost-time claims (NLTCs) have become increasingly blurred in Ontario due to the increased use of workplace accommodation, or claims management practices (e.g., returning injured workers to the workplace before they are able or not reporting time lost from work). A better understanding of whether NLTCs are becoming more similar to LTCs — or if there are factors outside of the injury itself that preferentially lead to no time off work being reported — have been hampered by the lack of information being electronically stored with NLTCs. This project will address this knowledge gap by matching NLTCs where detailed information has been collected, to LTCs in the WSIB administrative database to compare the types of injuries submitted as NLTC and LTC among similar types of employers over three time periods (1996, 2000 and 2005); and to examine what characteristics of workers and workplaces are associated with an injury being LTC versus a NLTC among similar types of injuries.

PROOF OF PRINCIPLE: ASSEMBLY OF AN IMMERSIVE VIRTUAL REALITY SIMULATION FOR HEAVY EQUIPMENT VEHICLES (#11036)

Principal Investigator: James P. Dickey (University of Western Ontario)

Co-Investigators: Steven S. Beauchemin, Ewan A. Macpherson (University of Western Ontario); Tammy R. Eger (Laurentian University)

Sponsoring Institution: University of Western Ontario

One-Year Funding: \$30,000.00

The objective of the project is to develop a realistic immersive virtual reality environment that can adequately simulate an occupational environment rather than merely the vibration exposure with simplified (static) postures as we have done previously. The study will replicate a fork-lift environment including controls, and the visual, auditory and vibration exposures representing a typical workplace. This will help accurately determine the health and comfort effects of occupational vibration exposure as well as interactions between the vibration, visual and auditory environment. The intended outcome is to develop a system for creating a totally immersive virtual workplace which will include a matched set of visual (full 3D world), auditory (sounds and noises) and vibrations (appropriate for the specific vehicle, speed and ground). This framework will enable the research team to investigate the complex interplay between vibration and the visual and auditory perceptions. Future objectives include controlled study of specific workplace features such work task performance under the influence of factors such as line of sight issues in fork-lifts and other relevant vehicles (such as load-haul-dump vehicles), or the combined trunk/neck rotation and vibration which is a high risk component of many vehicle operations.

DEVELOPMENT OF A SERIOUS GAME TO PROMOTE SAFER LIFTING TECHNIQUES IN THE FIRE SERVICE (#11042)

Principal Investigator: Andrew Hogue (University of Ontario Institute of Technology)

Co-Investigators: Bernadette A. Murphy, Bill Kapralos (University of Ontario Institute of Technology)

Sponsoring Institution: University of Ontario Institute of Technology

One-Year Funding: \$29,978.00

Back pain accounts for 33% of all Canadian workers' compensation claims. Improper lifting techniques can lead to acute low back injuries and chronic low back disability. Virtual reality simulations and video games are used as a form of teaching in many occupational settings. This study aims to develop a prototype for an interactive serious game using inexpensive gaming hardware to provide an effective educational and reinforcement tool for fire fighters to

learn correct lifting techniques that can be visualized and practiced in a safe working environment prior to utilizing these techniques on the fire ground or in the fire hall. Preliminary bio-mechanical data on the loads lifted routinely by firefighters will also be collected to determine how loads can be incorporated into more advanced versions of the game. By using the latest advancements in game technology, such as Microsoft's Kinect™, the study will perform real-time sensing of full-body posture of the participants to provide in-game feedback to the player. Using well-understood video game design methodologies, the researchers intend to create a compelling environment that engages fire-fighters in a training regime that is fun, exciting, competitive, and has minimal entry barriers (*i.e.*, no need to wear motion capture markers, little to no setup).

UNDERSTANDING THE KNOWLEDGE, SKILL, AND RESOURCE NEEDS OF FRONT-LINE PREVENTION SYSTEM PARTNERS FOR OCCUPATIONAL SKIN DISEASE (#11105)

Principal Investigator: D. Linn Holness (St. Michael's Hospital)

Co-Investigators: Irena Kudla, Eman Leung (St. Michael's Hospital); Kathryn Nichol (Public Services Health and Safety Association)

Sponsoring Institution: St. Michael's Hospital

One-Year Funding: \$59,608

Occupational diseases are important but less attention has been focused on an organized approach to prevention. Health and Safety Associations (HSAs) provide prevention services to Ontario workplaces. Occupational health and safety consultants (OHSCs) at the HSAs may lack knowledge and tools related to occupational disease that could impair delivery of occupational disease prevention services. This application seeks to gain an understanding of the needs of OHSCs related to occupational disease. The project will focus on occupational skin disease, but will also aid in the prevention of occupational diseases generally. Focus groups of OHSCs from the four HSAs will be conducted. The results will be analyzed to determine key knowledge, skill and resource needs of Ontario OHSCs to better develop, implement and evaluate prevention materials aimed at reducing exposure to hazards and thereby reducing occupational disease. A workshop will be held with system partners to review the results and develop a program to address gaps. It will also identify other groups for needs assessment activity.

THE AUTHENTICATION OF A HUMAN POSTURE PREDICTION TOOL USED FOR VIRTUAL ERGONOMIC ANALYSES (#11106)

Principal Investigator: Joel A. Cort (University of Windsor)

Co-Investigators: None

Sponsoring Institution: University of Windsor

One-Year Funding: \$35,523.65

Work-related musculoskeletal disorders continue to be prevalent causing negative health consequences for Ontario workers. Currently, ergonomists may have access to commercially available human simulation ergonomic tools to aid in the assessment of human demands and capabilities required to safely manufacture products. Computer-aided simulation tools allow ergonomists to replicate worker-product interactions. A digitally created human model can interact with digital renderings of workstations and products by manually manipulating, or posturing, the human model. However, manual posturing of digital human models is a very time consuming task, which may limit the effectiveness of the simulation ergonomics. To contend with such a constraint, the Siemens Human Simulation Tool (*Jack*), an ergonomic human simulation software tool, contains a *Human Posturing Tool (HPT)*. The HPT is able to predict whole body posturing necessary for human-product interactions. Although considered accurate, the developers of the HPT aspire to authenticate the HPT's ability to predict whole-body postures during one-handed force exertions. The purpose of this project is to improve ergonomic analysis completed through human simulation by authenticating the results of the automated HPT within *Jack*, to real-world human whole-body posturing behavior while performing one-handed force exertions.

COGNITIVE CONSEQUENCES OF SLEEP DEPRIVATION, SHIFT WORK, AND HEAT EXPOSURE FOR UNDERGROUND MINERS (#11107)

Principal Investigator: Glenn Legault (Laurentian University)

Co-Investigators: Nancy Keller (Vale Inco); Stephen Hardcastle (CANMET Natural Resources Canada); Glen Kenny (University of Ottawa); Al Bryenton (Biopeak Corporation)

Sponsoring Institution: Laurentian University

One-Year Funding: \$47,506.14

Humans often experience negative physical, emotional, and cognitive consequences as a result of sleep loss. Abnormal sleep patterns arising from working rotating shifts also contribute to physical and cognitive dysfunction. When combined, the possibility of attentional lapses increases. Other literature reports that humans experiencing heat exposure exhibit cognitive decline. Thus, for underground miners, three possible causes of reduced ability to pay attention to tasks arise during working times. They may begin working having experienced poor sleep, or they may have altered circadian patterns over preceding days and they may then experience heat exposure during their shift. The proposed research will evaluate each of these three possible sources of attentional deficit for miners engaged in potentially dangerous activities in hot environments. The research will determine if poor sleep quality and altered circadian patterns leave those working in a hot underground environment with reduced cognitive function (i.e., decision making ability, mental alertness, etc). Clearly, such a possibility is important to employers in the mining sector from an occupational health and safety context.

DESIGN AND ASSESSMENT OF A MOVER'S ASSISTIVE DEVICE BASED ON EFFECTIVENESS AND USER-ACCEPTABILITY (#11109)

Principal Investigator: Joan M. Stevenson (Queen's University)

Co-Investigators: Patrick A. Costigan, J. Timothy Bryant, Victor Pakalnis (Queen's University)

Sponsoring Institution: Queen's University

One-Year Funding: \$59,990.00

The purpose of this study is to develop a movers' assistive device (MAD) for use by professional movers that is effective, safe and has high user-acceptability. Based on needs and injury assessments with three commercial moving companies conducted under RAC-funded project #05107, it was discovered that moving boxes make up 50% to 60% of the demand for homeowner moves and more so for commercial companies. Movers want to move items quickly and often carry more than one box at a time using either an anterior load carry (ACL) or a posterior load carry (PCL). Based on movers' criteria, the applicants created a movers' pack with a support ledge and tested its effectiveness using electromyography and user trials. The current application will allow the applicants to complete the MAD design phase in three stages and test it for effectiveness with professional movers in a laboratory situation. After the second MAD iteration, the study will assess the joint loading of professional movers while lifting, carrying, and lowering 16kg in a large moving box using an ACL, PCL and using the MAD ergonomic aid during ACL and PCL. Subjective feedback will also be collected during this study and during field trials for the third and fourth design iterations.

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May 1, 2012

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