

Topics

Clinical	1
Specific Injuries	2
Workplace Interventions	1
Workplace Intervention Organizational	1
Workforce	5

Research Alerts is a service provided to you by the Institute for Work & Health, CRE-MSD, CREOD and CREIDO to help you keep abreast of new occupational health and safety research literature. Please note that these articles have not been reviewed by Institute scientists to assess the quality of the studies. *Research Alerts* should not be considered an endorsement of the findings. Readers are cautioned not to act on the results of single studies, but rather to seek bodies of evidence.

Clinical

Clinical effectiveness of aquatic exercise to treat chronic low back pain: a randomized controlled trial.

STUDY DESIGN: This study was a prospective, randomized, controlled study.

OBJECTIVE: To compare the effectiveness of aquatic exercise interventions with land-based exercises in the treatment of chronic low back pain (CLBP).

SUMMARY OF BACKGROUND DATA: Land-based exercise and physiotherapy are the main treatment tools used for CLBP. Clinical experience indicates that aquatic exercise may have advantages for patients with musculoskeletal disorders.

METHODS: A total of 65 patients with CLBP were included in this study. Patients were randomly assigned to receive aquatic exercise or land-based exercise treatment protocol. Aquatic exercise program consisted of 20 sessions, 5 x per week for 4 weeks in a swimming pool at 33 degrees C. Land-based exercise (home-based exercise) program were demonstrated by a physiotherapist on one occasion and then they were given written advice. The patients were assessed for spinal mobility, pain, disability, and quality of life. Evaluations were performed before treatment (week 0) and after treatment (week 4 and week 12).

RESULTS: In both groups, statistically significant improvements were detected in all outcome measures (except modified Schober test) compared with baseline. However, improvement in modified Oswestry Low Back Pain Disability questionnaire and physical function and role limitations due to physical functioning subpart of Short-Form 36 Health Survey were better in aquatic exercise group (P < 0.05).

CONCLUSION: It is concluded that a water-based exercises produced better improvement in disability and quality of life of the patients with CLBP than land-based exercise

Dundar U, Solak O, Yigit I, Evcik D, and Kavuncu V. Clinical effectiveness of aquatic exercise to treat chronic low back pain: a randomized controlled trial. Spine. 2009; 34(14):1436-1440.

Development and evaluation of an observational Back-Exposure Sampling Tool (Back-EST) for work-related back injury risk factors.

Abstract: We developed and evaluated an observational Back-Exposure Sampling Tool. A literature review suggested 53 exposure variables; these were reduced to 20 following field trials. Kappas for agreement beyond chance between six observers assessing exposures in 72 photos ranged from 0.21 to 1.0, with the highest values for posture type, trunk angle, manual materials handling, hands on item, and load weight. Intraclass correlations for agreement between pairs observing 17 workers once per minute for a full-shift were >0.74 for most postural, trunk angle, and manual materials handling variables. In validity testing, the proportions of shifts in flexion/extension and lateral bending observed for 169 full-shifts were compared to inclinometer measurements. Pearson correlations were 0.42 for 45-60 degrees flexion and 0.9 for >60 degrees flexion, but only 0.11-0.19 for lateral bending and trunk flexion less than 45 degrees. When lower flexion angles were collapsed to include trunk extension, correlations increased to >0.5

Village J, Trask C, Luong N, Chow Y, Johnson P, Koehoorn M, and Teschke K. Development and evaluation of an observational Back-Exposure Sampling Tool (Back-EST) for work-related back injury risk factors. Applied Ergonomics. 2009; 40(3):538-544.

Please note that these articles have not been reviewed by Institute scientists to assess the quality of the studies. *Research Alerts* should not be considered an endorsement of the findings.

* Denotes articles co-authored by IWH researchers

Development and validation of an index of musculoskeletal functional limitations.

BACKGROUND: While musculoskeletal problems are leading sources of disability, there has been little research on measuring the number of functionally limiting musculoskeletal problems for use as predictor of outcome in studies of chronic disease. This paper reports on the development and preliminary validation of a self administered musculoskeletal functional limitations index.

METHODS: We developed a summary musculoskeletal functional limitations index based upon a six-item self administered questionnaire in which subjects indicate whether they are limited a lot, a little or not at all because of problems in six anatomic regions (knees, hips, ankles and feet, back, neck, upper extremities). Responses are summed into an index score. The index was completed by a sample of total knee replacement recipients from four US states. Our analyses examined convergent validity at the item and at the index level as well as discriminant validity and the independence of the index from other correlates of quality of life.

RESULTS: 782 subjects completed all items of the musculoskeletal functional limitations index and were included in the analyses. The mean age of the sample was 75 years and 64% were female. The index demonstrated anticipated associations with self-reported quality of life, activities of daily living, WOMAC functional status score, use of walking support, frequency of usual exercise, frequency of falls and dependence upon another person for assistance with chores. The index was strongly and independently associated with self-reported overall health.

CONCLUSION: The self-reported musculoskeletal functional limitations index appears to be a valid measure of musculoskeletal functional limitations, in the aspects of validity assessed in this study. It is useful for outcome studies following TKR and shows promise as a covariate in studies of chronic disease outcomes

Katz JN, Wright EA, Baron JA, and Losina E. Development and validation of an index of musculoskeletal functional limitations. BMC Musculoskeletal Disorders. 2009; 10:[1-9].

Development, validity, and reliability of The Assessment of Pain and Occupational Performance (POP): a new instrument using two dimensions in the investigation of disability in back pain.

BACKGROUND CONTENT: Questionnaires for measuring the functional status of patients with low back pain (LBP) focus on disability and present responses for each question in a predetermined, fixed relationship between "can do/difficulties and pain." Their design does not permit a separation of the two.

PURPOSE: To present the development of The Assessment of Pain and Occupational Performance (POP) and to evaluate validity and reliability.

STUDY DESIGN: A prospective, consecutive study of patients investigated by use of the POP.

PATIENT SAMPLE: A total of 220 patients participated in the study. **METHODS:** In a cross-sectional study including 53 patients with chronic musculoskeletal pain, empirical tests of content and construct validity established the definitive version of the POP. The POP focuses on performance of activities. It is a disease-specific, discriminative assessment instrument designed for patients with back pain (BP) and LBP. Based on a semi-structured interview the POP investigates each of 36 activities in two dimensions, with separate, defined scales from "normally healthy" to "extremes" for level of activity (x-scale) and pain intensity (y-scale). The final scores are expressed in percent, 0% to 100%. Patients with chronic LBP (CLBP) (n=142) were allocated to the specific (S) group, that is, patients with specific LBP problems (n=97) or to the nonspecific (NS) group, that is, those with NS BP (n=45). The ability of the POP to differentiate between the two known groups was evaluated. Construct-convergent validity between the POP and the Oswestry Disability Index (ODI) was carried out for the S group. Inter-rater reliability was established between six pairs of raters who examined 25 patients recruited from primary health care, the P-LBP group.

RESULTS: In construct known group validity, the median, the interquartile range, and the Mann-Whitney U test showed that the S group had a significantly higher level of activity ($p<.001$) combined with worse pain ($p=.001$) compared with the NS group. There were significant differences between the two groups in performing activities in the forward bending position (10 items) and in the upright standing position (9 items). The result of Spearman rank order correlation showed a strong relationship between the ODI and the POP for level of activity ($r=0.70$, $p<or=.001$). The multiple correlation coefficient between the total score of the ODI (10 items) and the total score of the POP (36 items) was $r=0.72$ and $p<or=.001$. Inter-rater reliability-the standard deviation of the differences was less than 1 point (scale 0-5). A Bland-Altman plot showed the mean differences for the level of activity of the dressing/undressing item. The average percentage agreement was 80% on the x- and y-scales. In POP 36, the average Kappa for level of activity was 0.79, which is good agreement, and for pain 0.84, which is very good agreement.

Please note that these articles have not been reviewed by Institute scientists to assess the quality of the studies. *Research Alerts* should not be considered an endorsement of the findings.

* Denotes articles co-authored by IWH researchers

CONCLUSION: The construction of the POP allows the patient to count, and the occupational therapist to investigate, from full level of activity to avoidance and from no pain to worst imaginable pain for each physically loaded task in personal activities of daily living (ADL), transfer/transport, instrumental ADL, and social activities. The POP can differentiate between groups concerning level of activity and pain, and appears to be a valid and reliable instrument for evaluating LBP. The POP should be considered for use in both clinical and research applications

Perneros G and Tropp H. Development, validity, and reliability of The Assessment of Pain and Occupational Performance (POP): a new instrument using two dimensions in the investigation of disability in back pain. Spine Journal. 2009; 9(6):486-498.

Comments on: "Development, validity, and reliability of The Assessment of Pain and Occupational Performance (POP)--a new instrument using two dimensions in the investigation of disability in low back pain: psychometric issues associated with the POP".

Gatchel R.J. Comments on: "Development, validity, and reliability of The Assessment of Pain and Occupational Performance (POP)--a new instrument using two dimensions in the investigation of disability in low back pain: psychometric issues associated with the POP". Spine Journal. 2009; 9(6):499-500 Spine Journal. 2009; 9(6):499-500.

Inter-rater reliability of three standardized functional tests in patients with low back pain.

BACKGROUND: Of all patients with low back pain, 85% are diagnosed as "non-specific lumbar pain". Lumbar instability has been described as one specific diagnosis which several authors have described as delayed muscular responses, impaired postural control as well as impaired muscular coordination among these patients. This has mostly been measured and evaluated in a laboratory setting. There are few standardized and evaluated functional tests, examining functional muscular coordination which are also applicable in the non-laboratory setting. In ordinary clinical work, tests of functional muscular coordination should be easy to apply. The aim of this present study was to therefore standardize and examine the inter-rater reliability of three functional tests of muscular functional coordination of the lumbar spine in patients with low back pain.

METHODS: Nineteen consecutive individuals, ten men and nine women were included. (Mean age 42 years, SD +/- 12 yrs). Two independent examiners assessed three tests: "single limb stance", "sitting on a Bobath ball with one leg lifted" and "unilateral pelvic lift" on the same occasion. The standardization procedure took altered positions of the spine or pelvis and compensatory movements of the free extremities into account. The inter-rater reliability was analyzed by Cohen's kappa coefficient (kappa) and by percentage agreement.

RESULTS: The inter-rater reliability for the right and the left leg respectively was: for the single limb stance very good (kappa: 0.88-1.0), for sitting on a Bobath ball good (kappa: 0.79) and very good (kappa: 0.88) and for the unilateral pelvic lift: good (kappa: 0.61) and moderate (kappa: 0.47).

CONCLUSION: The present study showed good to very good inter-rater reliability for two standardized tests, that is, the single-limb stance and sitting on a Bobath-ball with one leg lifted. Inter-rater reliability for the unilateral pelvic lift test was moderate to good. Validation of the tests in their ability to evaluate lumbar stability is required

Tidstrand J and Horneij E. Inter-rater reliability of three standardized functional tests in patients with low back pain. BMC Musculoskeletal Disorders. 2009; 10:[1-8].

Intramuscular oxygen-ozone therapy in the treatment of acute back pain with lumbar disc herniation: a multicenter, randomized, double-blind, clinical trial of active and simulated lumbar paravertebral injection.

STUDY DESIGN: Multicenter randomized, double-blind, simulated therapy-controlled trial in a cohort of patients with acute low back pain (LBP) due to lumbar disc herniation (LDH).

OBJECTIVE: To assess the benefit of intramuscular-paravertebral injections of an oxygen-ozone (O2O3) mixture.

SUMMARY OF BACKGROUND DATA: Recent findings have shown that O2O3 therapy can be used to treat LDH that fails to respond to conservative management. However, these findings are based on intradiscal/intraforaminal O2O3 injection, whereas intramuscular-paravertebral injection is the technique used most in clinical practice in Italy and other Western countries.

METHODS: Sixty patients suffering from acute LBP caused by LDH was randomized to an intramuscular O2O3 or control group. Patients were observed up to assess pain intensity, LBP-related disability, and drug intake (15 [V2] and 30 [V3] days after treatment started, and 2 weeks [V4], and 3 [V5] and 6 [V6] months after treatment ended).

RESULTS: A significant difference between the 2 groups in the percentage of cases who had become pain-free (61% vs. 33%, P < 0.05) was observed at V6. Patients who received O2O3 had a lower mean pain score than patients who received simulated therapy throughout the observation period. A significant improvement was observed in LBP-related

Please note that these articles have not been reviewed by Institute scientists to assess the quality of the studies.

Research Alerts should not be considered an endorsement of the findings.

* Denotes articles co-authored by IWH researchers

disability in the study group patients when compared with the control group patients. Active O2O3 therapy was followed by a significantly lower number of days on nonsteroidal anti-inflammatory drugs at V2 and V3 and by a lower number of days at V4. No adverse events were reported.

CONCLUSION: Treatment of LBP and sciatica is a major concern. Although the natural history of acute LBP is often self-limiting, conservative therapies are not always effective; in such cases, O2O3 intramuscular lumbar paravertebral injections, which are minimally invasive, seem to safely and effectively relieve pain, as well as reduce both disability and the intake of analgesic drugs

Paoloni M, Di Sante L, Cacchio A, Apuzzo D, Marotta S, Razzano M, Franzini M, and Santilli V. Intramuscular oxygen-ozone therapy in the treatment of acute back pain with lumbar disc herniation: a multicenter, randomized, double-blind, clinical trial of active and simulated lumbar paravertebral injection. Spine. 2009; 34(13):1337-1344.

* Utilization and costs of lumbar and full spine radiography by Ontario chiropractors from 1994 to 2001.

BACKGROUND CONTEXT: In Ontario, chiropractors see one-third of patients who seek care for low back pain. Previous studies suggest that chiropractors have high utilization rates of lumbar and full spine radiography. There has been a proliferation of evidence-based guidelines recommending that plain film radiography be used only to assess high-risk patients with low back pain. Evidence for the use of full spine radiography, except for the evaluation of scoliosis is lacking. It is uncertain what impact the growing evidence against their use has had on radiography utilization by Ontario chiropractors.

PURPOSE: To describe the annual costs and use of lumbar and full spine plain film radiography among Ontario chiropractors between 1994 and 2001.

STUDY DESIGN/SETTING: Time-trend analysis of radiography utilization by Ontario chiropractors.

PATIENT SAMPLE: Chiropractic claims data submitted to the Ontario Health Insurance Plan or the Workplace Safety & Insurance Board from 1994/1995 to 2000/2001.

OUTCOME MEASURES: Change in the annual cost and proportion of claimants receiving lumbar and full spine radiography.

METHODS: Time-trend analysis of chiropractic claims submitted to the Ontario Health Insurance Plan (OHIP) or Workplace Safety & Insurance Board (WSIB) from 1994/1995 to 2000/2001 fiscal years.

RESULTS: During the 7-year period, the proportion of OHIP claimants receiving lumbar spine radiography decreased from 4.54% to 3.25% and for full spine radiography from 3.87% to 3.04%. For WSIB claimants, lumbar spine radiography decreased from 6.49% to 3.30% of claimants and full spine radiography from 1.51% to 0.94%. OHIP payments for lumbar spine radiography decreased 12.7% to \$562,944, whereas full spine radiography payments decreased 5.3% to \$1,071,408. WSIB lumbar and full spine radiography payments decreased 44.2% and 34.3% to \$31,202 and \$11,713 respectively.

CONCLUSIONS: Claims data from the two largest third-party payers of chiropractic services in Ontario, suggest that lumbar and full spine radiography, and their associated costs decreased steadily between 1994 and 2001

Ammendolia C, Cote P, Hogg-Johnson S, and Bombardier C. Utilization and costs of lumbar and full spine radiography by Ontario chiropractors from 1994 to 2001. Spine Journal. 2009; 9(7):556-563.

Please note that these articles have not been reviewed by Institute scientists to assess the quality of the studies. Research Alerts should not be considered an endorsement of the findings.

* Denotes articles co-authored by IWH researchers

Workplace Interventions

Estimating investment worthiness of an ergonomic intervention for preventing low back pain from a firm's perspective.

Abstract: A mathematical model was developed for estimating the net present value (NPV) of the cash flow resulting from an investment in an intervention to prevent occupational low back pain (LBP). It combines biomechanics, epidemiology, and finance to give an integrated tool for a firm to use to estimate the investment worthiness of an intervention based on a biomechanical analysis of working postures and hand loads. The model can be used by an ergonomist to estimate the investment worthiness of a proposed intervention. The analysis would begin with a biomechanical evaluation of the current job design and post-intervention job. Economic factors such as hourly labor cost, overhead, workers' compensation costs of LBP claims, and discount rate are combined with the biomechanical analysis to estimate the investment worthiness of the proposed intervention. While this model is limited to low back pain, the simulation framework could be applied to other musculoskeletal disorders. The model uses Monte Carlo simulation to compute the statistical distribution of NPV, and it uses a discrete event simulation paradigm based on four states: (1) working and no history of lost time due to LBP, (2) working and history of lost time due to LBP, (3) lost time due to LBP, and (4) leave job. Probabilities of transitions are based on an extensive review of the epidemiologic review of the low back pain literature. An example is presented

Hughes RE and Nelson NA. Estimating investment worthiness of an ergonomic intervention for preventing low back pain from a firm's perspective. Applied Ergonomics. 2009; 40(3):457-463.

Workplace Interventions Organizational

*Designing a workplace return-to-work program for occupational low back pain: an intervention mapping approach.

BACKGROUND: Despite over 2 decades of research, the ability to prevent work-related low back pain (LBP) and disability remains elusive. Recent research suggests that interventions that are focused at the workplace and incorporate the principals of participatory ergonomics and return-to-work (RTW) coordination can improve RTW and reduce disability following a work-related back injury. Workplace interventions or programs to improve RTW are difficult to design and implement given the various individuals and environments involved, each with their own unique circumstances. Intervention mapping provides a framework for designing and implementing complex interventions or programs. The objective of this study is to design a best evidence RTW program for occupational LBP tailored to the Ontario setting using an intervention mapping approach. **METHODS:** We used a qualitative synthesis based on the intervention mapping methodology. Best evidence from systematic reviews, practice guidelines and key articles on the prognosis and management of LBP and improving RTW was combined with theoretical models for managing LBP, improving RTW and changing behaviour. This was then systematically operationalized into a RTW program using consensus among experts and stakeholders. The RTW Program was further refined following feedback from nine focus groups with various stakeholders. **RESULTS:** A detailed five step RTW program was developed. The key features of the program include; having trained personnel coordinate the RTW process, identifying and ranking barriers and solutions to RTW from the perspective of all important stakeholders, mediating practical solutions at the workplace and, empowering the injured worker in RTW decision-making. **CONCLUSION:** Intervention mapping provided a useful framework to develop a comprehensive RTW program tailored to the Ontario setting

**Ammendolia C, Cassidy D, Steenstra I, Soklaridis S, Boyle E, Eng S, Hamer H, Bains B, and Cote P. Designing a workplace return-to-work program for occupational low back pain: an intervention mapping approach. BMC Musculoskeletal Disorders. 2009; 10:[1-33].*

Ergonomics contributions to company strategies.

Abstract: Managers usually associate ergonomics with occupational health and safety and related legislation, not with business performance. In many companies, these decision makers seem not to be positively motivated to apply ergonomics for reasons of improving health and safety. In order to strengthen the position of ergonomics and ergonomists in the business and management world, we discuss company strategies and business goals to which ergonomics could contribute. Conceptual models are presented and examples are given to illustrate: (1) the present situation in which ergonomics is not part of regular planning and control cycles in organizations to ensure business performance; and (2) the desired situation in which ergonomics is an integrated part of strategy formulation and

Please note that these articles have NOT been reviewed by Institute scientists to assess the quality of the studies.
Research Alerts should not be considered an endorsement of the findings.

* Denotes articles co-authored by IWH researchers

implementation. In order to realize the desired situation, considerable changes must take place within the ergonomics research, education and practice community by moving from a health ergonomics paradigm to a business ergonomics paradigm, without losing the health and safety goals

Dul J and Neumann WP. Ergonomics contributions to company strategies. Applied Ergonomics. 2009; 40(4):745-752.

Integrating ergonomics into production system development--the Volvo Powertrain case.

Abstract: Understanding the barriers and assists to integrating ergonomics into production system design remains a research issue. An action research case study at Volvo Powertrain/Sweden was conducted. Researchers worked collaboratively with the firm in efforts to improve the company's ability to handle ergonomics in their daily work of improving and developing production systems. Researchers observed and reflected collectively on the change process using field notes and recordings to support their observations. Observed integration barriers included both individual level issues like life events, and organisational aspects such as communication barriers between groups or assignment of tasks to people not involved in decision-making. Observed assists included the 'political reflective navigation' (c.f. Broberg, O., Hermund, I., 2004. The OHS consultant as a 'political reflective navigator' in technological change processes. *International Journal of Industrial Ergonomics* 33 (4), 315-326) by the project owner to find new ways to overcome barriers and anchor ergonomics into the organisation. While special 'ergonomics' groups did not survive long, progress was observed in including ergonomics in regular design groups. A cross-functional workshop that fostered discussion across organisational boundaries helped shift focus from retrofitting systems to future production systems and improve engagement of engineering teams. Progress was marked by both success and setbacks and full integration appears to require more than 2 years time. It is concluded that support by senior managers should include succession planning for personnel that are key to the change effort

Neumann WP, Ekman M, and Winkel J. Integrating ergonomics into production system development--the Volvo Powertrain case. Applied Ergonomics. 2009; 40(3):527-537.

Specific Injuries

Administrative delays and chronic disability in patients with acute occupational low back injury.

OBJECTIVES: This study assessed whether an organizational factor, delays to claim acceptance or administrative delays, had an influence on outcomes for individuals with acute back injuries in the workers' compensation system.

METHODS: Multivariate logistic regression was used to test whether individuals who experienced administrative delays were more likely to develop chronic disability than those who did not experience delays.

RESULTS: Beyond the first 2 weeks, each interval of administrative delay was associated with increased odds of developing chronic disability. Injury severity, physician experience and weeks to medical treatment were additionally very strong predictors for the development of chronic disability.

CONCLUSIONS: Insurers, employers, and policy makers can significantly reduce chronic disability if controls are adopted to reduce administrative and treatment delays and to direct workers to experienced clinicians

Sinnott P. Administrative delays and chronic disability in patients with acute occupational low back injury. Journal of Occupational & Environmental Medicine. 2009; 51(6):690-699.

Analyzing musculoskeletal neck pain, measured as present pain and periods of pain, with three different regression models: a cohort study.

BACKGROUND: In the literature there is a discussion on the choice of outcome and the need for more longitudinal studies of musculoskeletal disorders. The general aim of this longitudinal study was to analyze musculoskeletal neck pain, in a group of young adults. Specific aims were to determine whether psychosocial factors, computer use, high work/study demands, and lifestyle are long-term or short-term factors for musculoskeletal neck pain, and whether these factors are important for developing or ongoing musculoskeletal neck pain.

METHODS: Three regression analyses were used to analyze the different outcomes. Present pain was analyzed with a marginal logistic model, for number of years with pain periods a Poisson regression model was used and for developing and ongoing pain a logistic Markov transition model was used. The results are presented as odds ratios, proportion ratios and rate ratios. The material consisted of web-based questionnaires answered by 1204 Swedish university students from a prospective cohort recruited in 2002.

Please note that these articles have not been reviewed by Institute scientists to assess the quality of the studies.
 Research Alerts should not be considered an endorsement of the findings.

* Denotes articles co-authored by IWH researchers

RESULTS: Perceived stress was a risk factor for present pain (PR=1.6), for developing pain (PR=1.7) and for number of years with pain (RR=1.3). High work/study demands was associated with present pain (PR=1.6); and with number of years with pain when the demands negatively affect home life (RR=1.3). Computer use pattern (number of times/week with a computer session [greater than or equal to]4h, without break) was a risk factor for developing pain (PR=1.7), but also associated with present pain (PR=1.4) and number of years with pain (RR =1.2). Among life style factors smoking (PR=1.8) was found to be associated to present pain. The difference between men and women in prevalence of musculoskeletal pain was confirmed in this study, but was smallest for the outcome ongoing pain (PR=1.4) compared to present pain (PR=2.4) and developing pain (PR=2.5).

CONCLUSIONS: By the use of different regression models the different aspects of the neck pain pattern could be addressed and the risk factors impact on the pain pattern was identified. Short-term risk factors were perceived stress, high work/study demands and computer use pattern (break pattern). Those were also long-term risk factors. For developing pain perceived stress and computer use pattern were risk factors

Grimby-Ekman A, Andersson EM, and Hagberg M. Analyzing musculoskeletal neck pain, measured as present pain and periods of pain, with three different regression models: a cohort study. BMC Musculoskeletal Disorders. 2009; 10:[1-30].

Self-reported versus expert-assessed work-relatedness of pain in the neck, shoulder, and arm.

OBJECTIVES: The aim of this study was to compare self-reported work-relatedness of neck-shoulder and arm pain with experts' assessments based on specific criteria.

METHODS: A sample of 217 employed participants in the Oslo Health Study 2000-2001, aged 30, 40, and 45 years, who reported neck-shoulder or arm pain in the past month, underwent a health examination. A criteria document for evaluating the work-relatedness of upper-extremity musculoskeletal disorders was used to -establish clinical diagnoses and assess the work-relatedness of pain with respect to the subject's present job. We measured agreement between the participants and experts on whether pain was related to work as observed agreement, positive and negative specific agreement, and kappa.

RESULTS: A major proportion of the cases were assessed as work-related, somewhat more frequently by self-report than when assessed by experts (80% versus 65% for neck-shoulder pain, and 78% versus 72% for arm pain, respectively). However, there was considerable disagreement as to which cases were work-related. The experts disagreed more frequently in cases that were reported as non-work-related (particularly for neck-shoulder pain and cases reported by men). Positive specific agreement was fairly high (76-85% in the total population), while negative specific agreement was lower (37-51%). Kappa values were also low (0.16-0.34).

CONCLUSIONS: Compared with expert assessment, self-reporting did not seem to particularly exaggerate work-relatedness. Nevertheless, there was considerable disagreement, especially on cases assessed as non-work--related. However, agreement will depend on the case definitions and the criteria for work-relatedness used both by the participants and the experts

Mehlum IS, Veiersted KB, Waersted M, Wergeland E, and Kjuus H. Self-reported versus expert-assessed work-relatedness of pain in the neck, shoulder, and arm. Scandinavian Journal of Work, Environment & Health. 2009; 35(3):222-232.

Shift work and the risk of ischemic heart disease - a systematic review of the epidemiologic evidence.

OBJECTIVE: The objective of this review was to evaluate the epidemiologic evidence for a causal relation -between shift work and ischemic heart disease.

METHODS: We conducted a systematic search until the end of March 2008 for studies providing information on the relative risk of ischemic heart disease in relation to shift work. The quality of included papers was evaluated with respect to design, exposure and outcome information, bias, and exposure response assessment.

RESULTS: Relevant information was retrieved from 14 studies. Seven of these analyzed fatal events, six -combined fatal and non-fatal events, while one study reported separately on both types of events. Relative risks ranged from 0.6-1.4 in 12 papers while two papers reported relative risks around 2.0. Most studies based on fatal events showed no or weak associations while studies that combined fatal and non-fatal events showed modest positive associations. In a majority of studies, we could not reasonably rule out negative or positive bias due to the quality of outcome or exposure information, or confounder control. Five studies used years in shift work for exposure response analysis and no consistent pattern were seen.

CONCLUSION: There is limited epidemiological evidence for a causal relation between shift work and ischemic heart disease

Frost P, Kolstad HA, and Bonde JP. Shift work and the risk of ischemic heart disease - a systematic review of the epidemiologic evidence. Scandinavian Journal of Work, Environment & Health. 2009; 35(3):163-179

Please note that these articles have not been reviewed by Institute scientists to assess the quality of the studies. Research Alerts should not be considered an endorsement of the findings.

* Denotes articles co-authored by IWH researchers

Work Productivity Impairment From Musculoskeletal Disorder Pain in Long-Term Caregivers.

OBJECTIVES: To examine the impact of Musculoskeletal Disorder (MSD) pain on work productivity in Long-Term Caregivers.

METHODS: An eight item work productivity impairment scale specific to MSD pain was constructed, evaluated and used as part of a telephone survey of LTCaregivers health.

RESULTS: The productivity impairment scale demonstrated good reliability and validity. The fifty-six of 71 caregivers (79%) reporting work-related MSD pain endorsed, on average > three of eight items in the impairment scale. Only two variables predicted productivity impairment: 1) pain frequency and 2) frequency of resident lifts and transfers.

CONCLUSIONS: Specifically linking MSD pain from manual resident lifting to impaired work productivity may provide employers with additional visible impact of manual lifting beyond compensation costs alone, and thus promote adoption of safer lifting practices

Gucer PW, Oliver M, Parrish JM, and McDiarmid M. Work Productivity Impairment From Musculoskeletal Disorder Pain in Long-Term Caregivers. Journal of Occupational & Environmental Medicine. 2009; 51(6):672-681.

Workforce

DASH questionnaire for the analysis of musculoskeletal symptoms in industry workers: a validity and reliability study.

PURPOSE: The disabilities of the arm, shoulder and hand (DASH) questionnaire is a self-administered region-specific outcome instrument developed as a measure of self-rated upper-extremity disability and symptoms. The aim of this study was to evaluate the reliability and the construct validity of the DASH questionnaire by establishing its correlation to the Medical Outcomes Study Short Form-36 (SF-36) in industry workers. Also we aimed to investigate whether the DASH can be used as a standardized questionnaire to evaluate the work-related musculoskeletal disorders (WMSDs) in upper extremity in industrial settings and epidemiological studies.

MATERIAL AND METHODS: The Turkish version's reliability and construct validity were evaluated in 240 industry workers with upper-extremity musculoskeletal complaints. Workers were asked to complete a packet that included the DASH and the SF-36. Test-retest reliability was assessed in all workers who filled in the DASH questionnaire 15 days later. Construct validity was evaluated by comparing the overall and work component DASH scores with SF-36 summary and subscales.

RESULTS: The mean DASH score for the textile workers whose duties were confection, dyeing, sewing, quality control and packaging was calculated as 65, 55, 68, 54 and 67, respectively. As a result of this study, pain intensity in shoulder, wrist and hand was significantly associated with the DASH score ($p < 0.05$). Internal consistency of the DASH was high (Cronbach alpha 0.91). Test-retest reliability was excellent for the overall DASH (intraclass correlation coefficient (ICC) 0.92). Moderate correlations ($p < 0.05$) were found between the overall and work component DASH and the SF-36 summary scales. Pearson correlation coefficients of the overall and work component DASH to the SF-36 subscales ranged from -0.33 to -0.82.

CONCLUSION: These results support that DASH is a reliable and valid instrument to measure functional disability and investigate the ergonomic risk factors in textile workers with upper-extremity musculoskeletal complaints

Kitis A, Celik E, Aslan UB, and Zencir M. DASH questionnaire for the analysis of musculoskeletal symptoms in industry workers: a validity and reliability study. Applied Ergonomics. 2009; 40(2):251-255.

Musculoskeletal complaints among nurses related to patient handling tasks and psychosocial factors--based on logbook registrations.

Abstract: The aims were to evaluate the inter-method reliability of a registration sheet for patient handling tasks, to study the day-to-day variation of musculoskeletal complaints (MSC) and to examine whether patient handling tasks and psychosocial factors were associated with MSC. Nurses ($n=148$) fulfilled logbooks for three consecutive working days followed by a day off. Low back pain (LBP), neck/shoulder pain (NSP), knee pain (KP), psychosocial factors (time pressure, stress, conscience of the quality of work) and patient transfers and care tasks were reported. The logbook was reliable for both transfer and care tasks. The numbers of nurses reporting MSC and the level of pain increased significantly during the three working days (15%-30% and 17%-37%, respectively) and decreased on the day off. Stress and transfer task were associated with LPB and transfer tasks were associated with KP. Our results confirm a

Please note that these articles have not been reviewed by Institute scientists to assess the quality of the studies.
Research Alerts should not be considered an endorsement of the findings.

* Denotes articles co-authored by IWH researchers

relationship between work factors and MSC and indicate that logs could be one way to obtain a better understanding of the complex interaction of various nursing working conditions in relation to MSC

Warming S, Precht DH, Suadicani P, and Ebbehoj NE. Musculoskeletal complaints among nurses related to patient handling tasks and psychosocial factors--based on logbook registrations. Applied Ergonomics. 2009; 40(4):569-576.

Static and dynamic postural loadings during computer work in females: Sitting on an office chair versus sitting on an exercise ball.

Abstract: Seated computer work results in prolonged static loading, which has been associated with the development of musculoskeletal disorders. A popular alternative to sitting on an office chair while performing computer work is to sit on an exercise ball. Sitting on an exercise ball might affect static and dynamic aspects of working posture. We monitored posture, muscle activation and spinal shrinkage in 10 females performing a 1-h typing task, while sitting on an office chair with armrests and while sitting on an exercise ball. Sitting on an exercise ball resulted in 33% more trunk motion and in 66% more variation in lumbar EMG. Both of these findings can be considered to be an advantage for the exercise ball. However, the fifth percentile and average lumbar EMG were also higher when sitting on an exercise ball, with 38% and 78%, respectively. In addition, more spinal shrinkage occurred when sitting on an exercise ball than when sitting on an office chair. Arm flexion was reduced, but trapezius activation was unaffected when sitting on an exercise ball. It is concluded that the advantages with respect to physical loading of sitting on an exercise ball may not outweigh the disadvantages

Kingma I and van Dieen JH. Static and dynamic postural loadings during computer work in females: Sitting on an office chair versus sitting on an exercise ball. Applied Ergonomics. 2009; 40(2):199-205.

Please note that these articles have not been reviewed by Institute scientists to assess the quality of the studies. *Research Alerts* should not be considered an endorsement of the findings.

* Denotes articles co-authored by IWH researchers