

IWH Research Alert
July 5, 2019

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***Nowak LL, Davis AM, Mamdani M, Beaton D, Kennedy C, and Schemitsch EH. A systematic review and standardized comparison of available evidence for outcome measures used to evaluate proximal humerus fracture patients. *Journal of Orthopaedic Trauma*. 2019; 33(7):e256-e262.**

<https://doi.org/10.1097/BOT.0000000000001462>

Abstract: OBJECTIVES: To summarize and appraise any patient-reported or clinician-measured outcome measures based on their measurement properties in proximal humerus fracture patients. DATA SOURCES AND STUDY SELECTION: MEDLINE, EMBASE, and CINAHL were searched from January 2000 to August 2018 to identify all studies of proximal humerus fracture patients that reported a measurement property evaluation of an outcome measure. DATA EXTRACTION AND SYNTHESIS: Quality appraisal of each measure was completed using the Evaluating the Measurement of Patient-Reported Outcomes (EMPRO) tool. The EMPRO takes into account all studies of each measure, and the overall score is transformed linearly to a range of 0 (lowest) to 100 (best). RESULTS: Eleven instruments were identified. Intended concepts of the instruments included clinician-measured shoulder function, patient-reported function or disability, and patient-reported general health state. Only the Disabilities of the Arm, Shoulder and Hand (DASH), Oxford

Shoulder Score, Constant Score, University of California, Los Angeles Shoulder Score, and EuroQol 5 Dimension (EQ5D) were evaluated in more than 1 study. The Shoulder Function Index (SFINX), DASH, and EQ5D had the highest EMPRO scores (80, 66, and 58, respectively). The SFINX and DASH consistently scored among the top 3 instruments for each attribute. **CONCLUSIONS:** Evidence on the measurement properties of outcome measures for proximal humerus fracture patients is limited. With the available evidence, the SFINX is recommended as a clinician-measured functional outcome measure, the DASH as a patient-reported functional outcome measure, and the EQ5D as a general health status measure

Abdoli-Eramaki M, Agababova M, Janabi J, Pasko E, and Damecour C. Evaluation and comparison of lift styles for an ideal lift among individuals with different levels of training. *Applied Ergonomics*. 2019; 78:120-126.

<https://doi.org/10.1016/j.apergo.2019.02.007>

Abstract: Training for safe lifting techniques is used by employers to lower their workers' exposure to risk of workplace injuries. To determine effectiveness of training, 266 attendees at two professional conferences were asked to identify and demonstrate their preferred lift technique with the demonstration being an ideal floor-to-waist height lift of a 10-kg weighted crate. 'Bend your knees' was the most frequent preferred cue for each of the self-reported participant groups: untrained (n=65), trained (n=86), and trainers (n=115) according to safe lifting techniques. The demonstrations showed that this cue was incorporated into the skill of lifting by all groups. Trained participants showed a stronger conformity for depth of squat; but, the overall variability suggested a lack of consensus on the ideal depth of squat. The trained group experienced less loading at L5/S1 ($p=.021$) compared to untrained that was countered by higher loading of the knee ($p=.046$). Trainers showed lower knee ($p=.006$) and shoulder ($p=.03$) loading with similar L5/S1 loading as the trained participants suggesting a broader set of criteria for safe lifting. While the study population was likely biased towards a common understanding of safe lifting techniques given the conferences were for ergonomists and safety professionals, the results provided valuable insight into potential knowledge gaps, and key messaging that is being delivered

and integrated into one's knowledge; a program review of lift training is recommended

Arnold E, La Barrie J, DaSilva L, Patti M, Goode A, and Clewley D. The effect of timing of physical therapy for acute low back pain on health services utilization: a systematic review. Archives of Physical Medicine & Rehabilitation. 2019; 100(7):1324-1338. <https://doi.org/10.1016/j.apmr.2018.11.025>

Abstract: OBJECTIVE: To synthesize literature about the effect of early physical therapy (PT) for acute low back pain (LBP) on subsequent health services utilization (HSU), compared to delayed PT or usual care. DATA SOURCES: Electronic databases (MEDLINE, CINAHL, Embase) were searched from their inception to May 2018. STUDY SELECTION: Study selection included randomized control trials and prospective and retrospective cohort studies that investigated the association between early PT and HSU compared to delayed PT or usual care. Two independent authors screened titles, abstracts, and full-text articles for inclusion based on eligibility criteria, and a third author resolved discrepancies. Eleven out of 1146 articles were included. DATA EXTRACTION: Two independent reviewers extracted data on participants, timing of PT, comparisons to delayed PT or usual care, and downstream HSU, and a third reviewer assessed the information to ensure accuracy and reach consensus. Risk of bias was assessed with the Downs and Black checklist using the same method. DATA SYNTHESIS: Eleven studies met eligibility criteria. Early PT is within 30 days of the index visit for acute LBP. Five out of 6 studies that compared early PT to delayed PT found that early PT reduces future HSU. Random effects meta-analysis indicated a significant reduction in opioid use, spine injection, and spine surgery. Five studies compared early PT to usual care and reported mixed results. CONCLUSIONS: Early PT for acute LBP may reduce HSU, cost, and opioid use, and improve health care efficiency. This review may assist patients, health care providers, health care systems, and third-party payers in making decisions for the treatment of acute LBP

Colim A, Arezes P, Flores P, and Braga AC. Effects of workers' Body Mass Index and task conditions on exertion psychophysics during Vertical Handling Tasks. Work. 2019;

63(2):231-241.

<https://doi.org/10.3233/WOR-192923>

Abstract: **BACKGROUND:** Obesity prevalence in the workforce is clearly increasing. Simultaneously, manual lifting/lowering loads, referred to as Vertical Handling Tasks (VHT) in this paper, are common in industries and services. Performing VHT exposes workers to physical overload, which can be measured using a psychophysical approach. Various risk factors can increase this overload, including individual factors such as workers' Body Mass Index (BMI).

OBJECTIVE: To study the possible effects of workers' BMI and some task conditions on physical overload during VHT. **METHODS:**

Psychophysical data were collected from 51 participants having different body constitutions (including non-obese, overweight and obese). The participants performed 6 VHT (3 different loads x2 workstation configurations), during which they lifted and lowered a test-box between their knees and shoulders. For each task, they reported their perceived exertion using the Borg Category Ratio-10 (CR-10) scale. **RESULTS:** The results showed that the CR-10 scale is sensitive to the variation of the task conditions tested. However, the psychophysical data pointed to a tendency to decrease the perception of physical overload as workers' BMI increases.

CONCLUSIONS: This may compromise the validity of the application of psychophysical data as an ergonomic approach for Work-Related Musculoskeletal Disorders (WRMSD) prevention in obese workers

Emmatty FJ and Panicker VV. Ergonomic interventions among waste collection workers: a systematic review. International Journal of Industrial Ergonomics. 2019; 72:158-172.

<https://doi.org/10.1016/j.ergon.2019.05.004>

Giraud M, Bena A, Mosca M, Farina E, Leombruni R, and Costa G. Differences in work injury risk between immigrants and natives: changes since the economic recession in Italy. BMC Public Health. 2019; 19(1):836.

<https://doi.org/10.1186/s12889-019-7178-2> [open access]

Abstract: **BACKGROUND:** It is known that occupational injury rates are higher for immigrant than for native workers, however the effects of the economic cycles on these differences has not been assessed to date. The aim of the paper is to test if the crisis has the same

mechanism of selection in the two groups by comparing injury rates in 2005 (before the crisis) and in 2010 (after the crisis). **METHODS:** The Work History Italian Panel-Salute integrated database was interrogated to identify employment contracts in the metalworking and construction industries for the years 2005 and 2010 and the occupational injuries. A definition based on the type of injury, less likely to be biased by underreporting, was used to select serious events. Immigrants and natives were matched using the propensity score method and injury rates were calculated in the two years. Analyses were stratified by industry. **RESULTS:** In the metalworking industry injury rates slightly increased over time for both groups, and were higher among immigrant than native workers in both 2005 and 2010. In the construction industry the 2005 injury rate was the same in the two groups, and there was a negative trend over time in both groups. However the decline in the 2010 injury rate for Italian workers was much larger, which led to a considerable increase of the incidence rate ratio of immigrants with respect to native (IRR 3.83, 95% CI 2.52-5.75). **CONCLUSIONS:** The economic recession had an impact on the risk of workplace injury. Though the main observed factors (18 variables) usually reported in literature to explain the higher injury rates of the immigrant workers were controlled through the matching, there were still differences between immigrants and natives. The main reason is that immigrants continue to be assigned to the more dangerous jobs and the more dangerous tasks within these job. Furthermore, also differences in the perception of workplace injury risks, linguistic barriers, and cultural factors may have a role in explaining this gap

Gomez R and Lamb D. Unions and non-standard work: union representation and wage premiums across non-standard work arrangements in Canada, 1997-2014. ILR Review. 2019; 72(4):1009-1035.

<https://doi.org/10.1177/0019793919852926>

Goodman S, Leos-Toro C, and Hammond D. Methods to assess cannabis consumption in population surveys: results of cognitive interviewing. Qualitative Health Research. 2019; 29(10):1474-1482.

<https://doi.org/10.1177/1049732318820523>

Abstract: The Cannabis Act legalized the possession and sale of nonmedical cannabis in Canada on October 17, 2018. Evaluating the impact of cannabis legalization requires a more thorough understanding than is provided by most existing measures of cannabis use. The aim of this study was to pretest a range of cannabis consumption measures used in a population-based survey and to share insights gained in the process. Cognitive interviewing was conducted among 10 cannabis users aged ≥ 16 years. Comprehension and self-reporting of consumption types and amounts, sources of purchase, and cannabinoid levels were examined. Findings revealed areas for improvement in a number of survey items, including unclear wording and reference images. Identified issues were used to improve the survey for use in the International Cannabis Policy Study. The authors discuss important principles (e.g., use of visual cues, user-selected units, and time frames) that should be adopted when assessing cannabis use in population-based studies

Hansen CD. Comparing fatal occupational accidents in Denmark and Sweden 1993-2012. Occupational Medicine. 2019; 69(4):283-286.

<https://doi.org/10.1093/occmed/kqz064>

Abstract: BACKGROUND: Denmark and Sweden are in many respects two very similar countries with similar welfare state systems and work environment authorities. Nevertheless, marked differences in the incidence of fatal occupational accidents have been found in earlier comparisons of the two countries. AIMS: To investigate differences in the incidence of fatal occupational accidents in the period from 1993 to 2012 to establish to what extent characteristics of the deceased can explain some of the difference between the two countries. METHODS: Analyses of the accident registers of the two countries' national work environment authorities with supplemental linkages to official registers on employment status are used to determine the incidence of fatal occupational accidents for different groups. The analysis is based on 2375 accidents (1068 in Denmark and 1307 in Sweden) over the period of 20 years. Poisson regression is used to derive incidence rates over time for specific groups. RESULTS: In the study period, the incidence of fatal occupational accidents decreased in both countries (incidence rate ratio [IRR]:

0.95), although the incidence was on average higher in Denmark (IRR: 1.20) and grew larger over time. This difference did not disappear after adjusting for age, sex and industry among the deceased (IRR: 1.12). **CONCLUSIONS:** The incidence of fatal occupational accidents was slightly higher in Denmark in the entire period. The difference could not be explained completely by sociodemographic differences or differences related to the labour market structure in the two countries, i.e. other factors (e.g. cultural) may play a role in producing the difference

Jeong I, Yoon JH, Roh J, Rhie J, and Won JU. Association between the return-to-work hierarchy and self-rated health, self-esteem, and self-efficacy. International Archives of Occupational & Environmental Health. 2019; 92(5):709-716.

<https://doi.org/10.1007/s00420-019-01406-7>

Abstract: **PURPOSE:** This study aimed to examine whether change of employer and/or job upon return-to-work after work-related injuries and diseases is related to health outcomes; self-rated health, self-esteem, and self-efficacy were used as indicators. **METHODS:** Data from the Panel Study of Workers' Compensation Insurance in Korea were used. A total of 1,610 workers who had returned to work after work-related injuries and diseases were included. The workers were divided into four groups according to their return-to-work characteristics: same employer, same job (n = 660); same employer, different job (n = 57); different employer, same job (n = 318); and different employer, different job (n = 575). Self-rated health, Rosenberg Self-Esteem Scale, and Self-Efficacy Scale scores were used as outcome variables. Logistic regression analysis was used. **RESULTS:** Compared to workers who had returned to the same employer and same job, those who had returned to the same employer but a different job were less likely to report good self-rated health (odds ratio [OR] 0.54; confidence interval [CI] 0.30-0.97). Those returning to a different employer but the same job were less likely to report good self-rated health (0.47, 0.35-0.64) and high self-esteem (0.73, 0.55-0.96). Those returning to a different employer and different job were less likely to report good self-rated health (0.49, 0.38-0.63), high self-esteem (0.68, 0.54-0.86), and high self-efficacy (0.66, 0.52-0.83). **CONCLUSIONS:** Change of employer and/or job related to health outcomes. Returning to the same employer and

same job should be set as a goal in the vocational rehabilitation process

Kulmala J, Luoma A, and Koskinen L. Able or unable to work? Life trajectory after severe occupational injury. Disability and Rehabilitation. 2019; 41(18):2192-2198.

<https://doi.org/10.1080/09638288.2018.1464603>

Abstract: Purpose: To study the probabilities and permanence of return to work, inability to work and rehabilitation, and to explore the connection between these life situations and later working after a severe occupational injury. Materials and methods: A historical cohort of Finnish workers with a severe occupational injury during 2008 (N = 11,585) were followed up annually on the outcomes of return to work over a 5-year observation period. We examined transition probabilities from one life situation to another with Markov chain analysis, and applied logistic regression with generalized estimating equations to assess the effect of register-based determinants on return to work. Results: Within the five anniversaries, 85% of the injured were working, 9% were unable to work (fully or partly) and 2% received rehabilitation. Age, gross annual income, type of work, injured body part, injury type and the injured's annual condition subsequent to the work injury were significant determinants of return to work. Conclusions: The probability of return to work decreased with time, but, on average, one-fifth of the injured workers succeeded in return to work after being unable to work on the previous anniversary, which indicates that it is worthwhile to conduct efforts for this target group in order to promote return to work. Implications for Rehabilitation The current life situation of the injured should be taken into account when promoting return to work, as it is a strong predictor of later working after a serious occupational injury. Rehabilitation and return to work programs should start in time due to declining return to work rates as the disability continues. Return to work on a part-time basis could be a good option during the early phases of recovery, since a notable proportion of those partly unable to work on the first anniversary returned later to full-time workers. The probability of recovery is relatively high even for those with long-term disabilities, so the promotion of return to work is highly recommended also for this target group

Momosaki R, Tsuboi M, Yasufuku Y, Furudate K, Kamo T, Uda K, et al. Conclusiveness of Cochrane Reviews in physiotherapy: a systematic search and analytical review. International Journal of Rehabilitation Research. 2019; 42(2):97-105.

<https://doi.org/10.1097/MRR.0000000000000338>

Abstract: Numerous Cochrane Reviews (CRs) in the field of physiotherapy have been published, but their conclusiveness has not been investigated. The purpose of this study was to provide an overview and describe the conclusiveness of evidence from CRs regarding physiotherapy. We conducted a systematic search using the Cochrane Database of Systematic Reviews in the Cochrane Library from 2008 through 2017 in the field of physiotherapy, the Physical Rehabilitation Evidence Database, and the CRs list on the Cochrane Rehabilitation website. Reviewers extracted the following data: year of publication, editorial group, number of articles meeting the criteria, number of patients enrolled, conclusiveness, and need for additional studies. Linear regression was used to determine whether the percentage of conclusive reviews was affected by the year of publication. Reviewers found 283 CRs in the field of physiotherapy, and only 16 (5.7%) of which were conclusive. The number of trials and participants enrolled in conclusive reviews were significantly higher than those in inconclusive reviews ($P < 0.001$). The percentage of conclusive reviews was significantly correlated with year of publication ($P = 0.03$). Almost all reviews recognized the need for additional studies. Most CRs in physiotherapy are inconclusive, and most emphasize the need for further research. The ability of a Cochrane Review to reach a conclusion is affected by the cumulative patient sample size and number of trials included in the analysis

Mutlu N and Altuntas S. Risk analysis for occupational safety and health in the textile industry: integration of FMEA, FTA, and BIFPET methods. International Journal of Industrial Ergonomics. 2019; 72:222-240.

<https://doi.org/10.1016/j.ergon.2019.05.013>

Rosa D, Terzoni S, Dellafiore F, and Destrebecq A. Systematic review of shift work and nurses' health. Occupational Medicine. 2019; 69(4):237-243.

<https://doi.org/10.1093/occmed/kqz063>

Abstract: **BACKGROUND:** Nursing is characterized by a working articulation in shifts to ensure continuity of care throughout the 24 h. However, shift work and the resulting desynchronization of circadian rhythms may have adverse effects on nurses' health. **AIMS:** To describe the effects of shift work and desynchronization of circadian rhythms on nurse's health. **METHODS:** Databases: PubMed, Cinahl, Scopus, Embase and Ilisi. Search terms (free terms, MeSH): 'nurses', 'shiftwork', 'nightwork', 'sleep disorder, circadian rhythm', 'work schedule tolerance', 'breast neoplasm', 'metabolic syndrome X', 'metabolic cardiovascular syndrome', 'Cardiovascular disease', 'stress', 'diabetes'. We included all randomized controlled trials, observational studies, reviews and papers studying nurses' shift work. Quality assessment of the retrieved papers was verified according to Dixon-Woods checklist. **RESULTS:** Twenty-four articles were analyzed. Literature review has shown that shift work involves an alteration in psychophysical homeostasis, with a decrease in performance. It is an obstacle for social and family relationships, as well as a risk factor for stress, sleep disorders, metabolic disorders, diabetes, cardiovascular disorders and breast cancer. **CONCLUSIONS:** An organized ergonomic turnaround can be less detrimental to the health of nurses and more beneficial for the healthcare providers. Therefore, we suggest organizing studies to assess whether improving nurses' health would lead to a reduction in miscarriages, absenteeism and work-related stress

See B, Juszczuk D, Parsons V, Smedley J, Gilworth G, and Madan I. Managing common mental health disorders in healthcare workers. Occupational Medicine. 2019; 69(4):290-293. <https://doi.org/10.1093/occmed/kqz068>

Abstract: **BACKGROUND:** Approximately a quarter of sickness absence in the UK National Health Service (NHS) is attributed to common mental health disorders (CMHDs). This is costly to the NHS and impacts on patient care and staff morale. Little is known about the occupational health (OH) management of NHS staff who take sick leave for CMHDs. **AIMS:** To explore the current OH management of NHS staff on sick leave for CMHDs. **METHODS:** We invited providers of NHS OH services identified from the NHS Health at Work Network and Commercial OH Providers Association to complete a survey on the management of employees off work because of CMHDs. Analysis

involved descriptive statistics and content analysis. RESULTS: Forty-nine (39%) of the 126 OH departments approached responded. The majority (98%) had an organizational sickness absence policy that included triggers for referral for staff absent with CMHDs. In 63%, referral occurred 8-28 days after the onset of absence; in 92%, the consultation was completed by an OH nurse or OH physician. Content of the first consultation often included assessment of symptoms and medication for CMHDs. Case management and regular reviews were least commonly used despite evidence on their effectiveness in supporting return to work. All providers offered some support for managers of staff with CMHDs. CONCLUSION: Variation existed between providers of NHS OH services in the timing of referrals, use of case management and regular reviews for staff with CMHDs. Our findings suggest that current evidence-based guidance on interventions to improve return to work is not being implemented consistently

**Tsang SMH, So BCL, Lau RWL, Dai J, and Szeto GPY.
Comparing the effectiveness of integrating ergonomics and motor control to conventional treatment for pain and functional recovery of work-related neck-shoulder pain: a randomized trial. European Journal of Pain. 2019; 23(6):1141-1152.**

<https://doi.org/10.1002/ejp.1381>

Abstract: BACKGROUND: Work-related neck and shoulder pain (WRNSP) is highly prevalent among patients who seek physiotherapy treatment. Clinicians may tend to focus on teaching home exercises and provide general advice about workplace improvement. The present study investigates the short- and long-term impact of an intervention approach that emphasizes on integrating the motor control re-education with ergonomic advice. METHODS: Participants diagnosed with WRNSP (n = 101) were randomly assigned into two groups in this randomized controlled trial. The Ergo-motor Group (EM, n = 51) received an integrated intervention with ergonomic advice/modifications and motor control training individualized for each participant based on their specific work demands. Control Group (CO, n = 50) received treatment for pain relief and general exercises of their necks at a designated physiotherapy clinic. Neck pain intensity and functional outcome measures were assessed before, immediately and 1-year after the 12-week intervention programmes.

Global Rating of Change Score was used to evaluate the perceived recovery at 1-year follow-up. RESULTS: Both groups reported significant reductions in pain and functional disability scores at post-intervention (EM, n = 44; CO, n = 42) and 1-year follow-up (EM, n = 40; CO, n = 38); however, no significant between-group differences were found ($p > 0.05$). Significantly higher rating in global recovery score was reported in EM group at 1-year follow-up ($p < 0.05$). CONCLUSIONS: Intervention integrating ergonomic advice/modification with motor control exercise was found to be equally effective as pain relief and general exercise for pain and functional recovery. However, at 1-year follow-up, such integrated approach resulted in significantly better global recovery perceived by people with WRNSP. SIGNIFICANCE: Integrating ergonomic intervention and motor control training achieved similar reduction in pain and functional outcomes compared to conventional physiotherapy at post-intervention and at 1-year follow-up, for patients with moderate level of work-related neck-shoulder pain and mild degree of functional disability. The Ergo-motor Group reported significantly better perceived overall recovery at 1-year follow-up

*IWH authored publication.