

IWH Research Alert
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***Sujic R, Beaton DE, Mamdani M, Cadarette SM, Luo J, Jaglal S, et al. Five-year refracture rates of a province-wide fracture liaison service. *Osteoporosis International*. 2019; 30(8):1671-1677.**

<https://doi.org/10.1007/s00198-019-05017-3>

Abstract: We examined the 5-year refracture rate of 6543 patients and found an overall rate of 9.7%. Adjusted analysis showed that presenting with multiple fractures was an indicator of a higher refracture risk; while presenting with an ankle fracture was associated with a lower refracture risk. INTRODUCTION: To examine refractures among patients screened in a province-wide fracture liaison service (FLS). METHODS: We assessed the 5-year refracture rate of fragility fracture patients aged 50+ who were screened at 37 FLS fracture clinics in Ontario, Canada. Refracture was defined as a new hip, pelvis, spine, distal radius, or proximal humerus fracture. Kaplan-Meier curves and Cox proportional hazards model adjusting for age, sex, and index fracture type were used to examine refracture rates. RESULTS: The 5-year refracture rate of 6543 patients was 9.7%. Those presenting with multiple fractures at baseline (i.e., two or more fractures occurring simultaneously) had the highest refracture rate of 19.6%. As compared to the 50-65 age group, refracture risk increased monotonically with age group (66-70 years: HR = 1.3, CI

95%, 1.0-1.7; 71-80 years: HR = 1.7, CI 1.4-2.1; 81+ years: HR = 3.0, CI 2.4-3.7). Relative to distal radius, presenting with multiple fractures at screening was associated with a higher risk of refracture (HR = 2.3 CI 1.6-3.1), while presenting with an ankle fracture was associated with a lower risk of refracture (HR = 0.7 CI 0.6-0.9). Sex was not a statistically significant predictor of refracture risk in this cohort (HR = 1.2, CI 1.0-1.5). **CONCLUSIONS:** One in ten patients in our cohort refractured within 5 years after baseline. Presenting with multiple fractures was an indicator of a higher refracture risk, while presenting with an ankle fracture was associated with a lower refracture risk. A more targeted FLS approach may be appropriate for patients at a higher refracture risk

Cicerone KD, Goldin Y, Ganci K, Rosenbaum A, Wethe JV, Langanbahn DM, et al. Evidence-based cognitive rehabilitation: systematic review of the literature from 2009 through 2014. Archives of Physical Medicine & Rehabilitation. 2019; 100(8):1515-1533.

<https://doi.org/10.1016/j.apmr.2019.02.011>

Abstract: **OBJECTIVES:** To conduct an updated, systematic review of the clinical literature, classify studies based on the strength of research design, and derive consensual, evidence-based clinical recommendations for cognitive rehabilitation of people with traumatic brain injury (TBI) or stroke. **DATA SOURCES:** Online PubMed and print journal searches identified citations for 250 articles published from 2009 through 2014. **STUDY SELECTION:** Selected for inclusion were 186 articles after initial screening. Fifty articles were initially excluded (24 focusing on patients without neurologic diagnoses, pediatric patients, or other patients with neurologic diagnoses, 10 noncognitive interventions, 13 descriptive protocols or studies, 3 nontreatment studies). Fifteen articles were excluded after complete review (1 other neurologic diagnosis, 2 nontreatment studies, 1 qualitative study, 4 descriptive articles, 7 secondary analyses). 121 studies were fully reviewed. **DATA EXTRACTION:** Articles were reviewed by the Cognitive Rehabilitation Task Force (CRTF) members according to specific criteria for study design and quality, and classified as providing class I, class II, or class III evidence. Articles were assigned to 1 of 6 possible categories (based on interventions for attention, vision and neglect, language and

communication skills, memory, executive function, or comprehensive-integrated interventions). DATA SYNTHESIS: Of 121 studies, 41 were rated as class I, 3 as class Ia, 14 as class II, and 63 as class III. Recommendations were derived by CRTF consensus from the relative strengths of the evidence, based on the decision rules applied in prior reviews. CONCLUSIONS: CRTF has now evaluated 491 articles (109 class I or Ia, 68 class II, and 314 class III) and makes 29 recommendations for evidence-based practice of cognitive rehabilitation (9 Practice Standards, 9 Practice Guidelines, 11 Practice Options). Evidence supports Practice Standards for (1) attention deficits after TBI or stroke; (2) visual scanning for neglect after right-hemisphere stroke; (3) compensatory strategies for mild memory deficits; (4) language deficits after left-hemisphere stroke; (5) social-communication deficits after TBI; (6) metacognitive strategy training for deficits in executive functioning; and (7) comprehensive-holistic neuropsychological rehabilitation to reduce cognitive and functional disability after TBI or stroke

Demarchi SJ, Oliveira CB, Franco MR, Morelhao PK, Hisamatsu TM, Silva FG, et al. Association of perceived physical overload at work with pain and disability in patients with chronic non-specific low back pain: a 6-month longitudinal study. European Spine Journal. 2019; 28(7):1586-1593.

<https://doi.org/10.1007/s00586-019-05986-3>

Abstract: BACKGROUND: Physical overload at work has been described as a risk factor for the development of low back pain. However, few studies have investigated the prognostic value of perceived physical overload at work in patients with chronic low back pain. OBJECTIVE: To investigate the association of perceived physical overload at work with pain and disability over a period of 6 months in patients with chronic non-specific low back pain. METHODS: Patients with chronic LBP seeking physiotherapy care were considered eligible. Clinical data collected were: pain intensity, disability, fear of movement, depression and perceived physical overload at work. Linear regression analyses were used to investigate the association of perceived physical workload at work at baseline with pain intensity and disability at 6-month follow-up. The total score and the score for each category of the physical overload at work questionnaire were analyzed separately. RESULTS: Ninety-two

patients with chronic low back pain were included in the analysis. The subcategories of the physical overload questionnaire were not significantly associated with pain intensity at 6-month follow-up. However, age, disability at baseline and perceived physical overload related to postures of the trunk ($B = -0.60$ 95% CI - 1.18 to - 0.02) and related to positions of the arms ($B = 2.72$ 95% CI 0.07 to 5.37) were significantly associated with disability at 6-month follow-up. **CONCLUSION:** Although perceived physical overload at work was not associated with pain intensity in patients with chronic LBP at 6-month follow-up, we identified a significant association between perceived physical overload related to postures of the trunk and positions of the arms with disability at 6-month follow-up. These slides can be retrieved under Electronic Supplementary Material

Frogeli E, Rudman A, and Gustavsson P. Preventing stress-related ill health among future nurses: effects over 3 years. International Journal of Stress Management. 2019; 26(3):272-286. <https://doi.org/10.1037/str0000110>

Harding T and Oetzel J. Implementation effectiveness of health interventions for indigenous communities: a systematic review. Implementation Science. 2019; 14(1):76.

<https://doi.org/10.1186/s13012-019-0920-4> [Open access]

Abstract: **BACKGROUND:** Translating research into practice is an important issue for implementing health interventions effectively for Indigenous communities. The Pikinga Waiora (HPW) is a recent implementation framework that provides a strong foundation for designing and implementing health interventions in Indigenous communities for non-communicable diseases around community engagement, culture-centred approach, systems thinking and integrated knowledge translation. This study addresses the following research question: How are the elements of the HPW Implementation Framework reflected in studies involving the implementation of a non-communicable disease health intervention in an Indigenous community? **METHODS:** A systematic review was conducted using multiple databases. Studies were included if they involved the implementation or evaluation of a health intervention targeting non-communicable diseases for Indigenous communities in Australia, Canada, New Zealand or the United States of America. Published

quantitative and qualitative literature from 2008 to 2018 were included. Methodological appraisal of the included articles was completed using the Joanna Briggs Institute System for the Unified Management, Assessment and Review of Information. Data on the population, topic, methods, and outcomes were detailed for each individual study. Key data extracted included the HPW elements along with study characteristics, who delivered the intervention and health outcomes. Data analysis involved a qualitative synthesis of findings as guided by a coding scheme of the HPW elements. RESULTS: Twenty-one studies were included. Health topics included diabetes, nutrition, weight loss, cancer and general health. The key themes were as follows: (a) two thirds of studies demonstrated high levels of community engagement; (b) from the culture-centred approach, two-thirds of studies reflected moderate to high levels of community voice/agency although only a third of the studies included structural changes and researcher reflexivity; (c) about a quarter of studies included multi-level outcomes and activities consistent with systems thinking, 40% had individual-level outcomes with some systems thinking, and 33% included individual-level outcomes and limited systems thinking; and (d) almost 40% of studies included high levels of end user (e.g., policy makers and tribal leaders) engagement reflective of integrated knowledge translation, but nearly half had limited end-user engagement. CONCLUSIONS: The HPW Implementation Framework is a comprehensive model for potentially understanding implementation effectiveness in Indigenous communities. The review suggests that the studies are reflective of high levels of community engagement and culture-centredness. The long-term sustainability and translation of evidence to practice may be inhibited because of lower levels of systems thinking and integrated knowledge translation. REGISTRATION: Not registered

Ishak AS, Haque MS, and Sadhra SS. Needlestick injuries among Malaysian healthcare workers. Occupational Medicine. 2019; 69(2):99-105.

<https://doi.org/10.1093/occmed/kqy129>

Abstract: BACKGROUND: Needlestick injury (NSI) is a significant occupational health issue among healthcare workers (HCWs). AIMS: To determine the national self-reported incidence and risk factors for NSI among Malaysian Ministry of Health (MOH) HCWs. METHODS:

Using data from the MOH national sharps injury surveillance programme, information on reported NSIs over a 1-year period (2016) for different HCW subgroups were extracted and analysed.

RESULTS: A total of 1234 NSI cases were reported in 2016, giving an overall incidence of 6 injuries per 1000 HCWs. Medical doctors recorded the highest incidence (21.1 per 1000 HCWs) followed by dental staff (7.5), pharmacy staff (4.2), nurses (3.7), medical assistants (3.4) and allied and auxiliary staff (1.0). Doctors had significantly increased risk of NSI compared with allied and auxiliary staff (relative risk [RR] = 20.7, 95% confidence interval [CI] 15.5-27.5), medical assistants (RR = 6.1, 95% CI 4.5-8.2), nurses (RR = 5.7, 95% CI 5.0-6.6), pharmacy staff (RR = 5.0, 95% CI 3.7-6.6) and dental staff (RR = 2.8, 95% CI 2.2-3.5). Significant differences were found in age and sharps-handling experience between occupational subgroups ($P < 0.001$ for both variables). Male employees had higher risk than females (RR = 1.33, 95% CI 1.18-1.50), with a significant difference seen in their sharps-handling experience ($P < 0.01$). Important risk factors included unsafe practices such as recapping of needles and their improper disposal. **CONCLUSIONS:** The national incidence of NSI amongst Malaysian HCWs was lower compared with other countries, but unsafe practices remain an important concern. There is a need to formulate, implement and monitor safe and consistent practices for the different healthcare professionals

Love PED, Teo P, Smith J, Ackermann F, and Zhou Y. The nature and severity of workplace injuries in construction: engendering operational benchmarking. *Ergonomics*. 2019; [Epub ahead of print].

<https://doi.org/10.1080/00140139.2019.1644379>

Abstract: To remain competitive and manage their safety performance, many construction organisations have engaged in benchmarking themselves against lagging indicators provided by a statutory body. Aggregated metrics that are provided by statutory bodies are not useful for the purpose of operational benchmarking, as 'best practice' is unable to be identified. Access to safety statistics from leading construction organisations' projects is seldom made available for the purposes of benchmarking. In addressing this void and to engender a process of operational benchmarking, a homogeneous dataset is used to examine 26,665 workplace injuries

that arose during the delivery of 562 projects over a 10-year period by a leading international Australian construction organisation. The nature and the degree of severity of the injuries that arose are statistically analysed. The findings provide invaluable insights into issues contributing to workplace injuries during construction, which can be used as a basis for operational benchmarking and a platform for engaging in continuous improvement. Practitioner summary: Workplace injuries are a problem in construction. Recognising that safety is a key goal for construction organisations, we analyse the nature of workplace injuries that occurred in 562 projects. Acknowledging the challenges of using lagging indicators, an operational framework for engendering best practice in workplace safety is presented

Lund CB, Mikkelsen S, Thygesen LC, Hansson GA, and Thomsen JF. Movements of the wrist and the risk of carpal tunnel syndrome: a nationwide cohort study using objective exposure measurements. Occupational and Environmental Medicine. 2019; 76(8):519-526.

<https://doi.org/10.1136/oemed-2018-105619> [Open access]

Abstract: OBJECTIVES: We conducted a large cohort study to investigate the association between work-related wrist movements and carpal tunnel syndrome (CTS). METHODS: Electro-goniometric measurements of wrist movements were performed for 30 jobs (eg, office work, child care, laundry work and slaughterhouse work). We measured wrist angular velocity, mean power frequency (MPF) and range of motion (ROM). We established a cohort of Danish citizens born 1940-1979 who held one of these jobs from age 18-80 years, using Danish national registers with annual employment information from 1992 to 2014. We updated the cohort by calendar year with job-specific and sex-specific means of measured exposures. Dates of a first diagnosis or operation because of CTS were retrieved from the Danish National Patient Register. The risk of CTS by quintiles of preceding exposure levels was assessed by adjusted incidence rate ratios (IRR(adj)) using Poisson regression models. RESULTS: We found a clear exposure-response association between wrist angular velocity and CTS with an IRR(adj) of 2.31 (95% CI 2.09 to 2.56) when exposed to the highest level compared with the lowest. MPF also showed an exposure-response pattern, although less clear, with an

IRR(adj) of 1.83 (1.68 to 1.98) for the highest compared with the lowest exposure level. ROM showed no clear pattern. Exposure-response patterns were different for men and women.

CONCLUSIONS: High levels of wrist movement were associated with an increased risk of CTS. Preventive strategies should be aimed at jobs with high levels of wrist movements such as cleaning, laundry work and slaughterhouse work

Miller AS, Ailey SH, Buchholz SW, Fogg L, and Ingram D. Improving stage of change in an employee wellness program. Workplace Health & Safety. 2019; 67(8):381-390.

<https://doi.org/10.1177/2165079919838291>

Abstract: Physical activity readiness of front-line employees caring for adults with disabilities (N = 381) improved during a two-phase project based on stages of change (SOC) theory. In Phase 1, we assessed barriers to, and readiness for, participation in an employee wellness program. We collected data from workers using focus groups and a preintervention physical activity readiness survey. Focus groups (N = 14) identified barriers, including lack of communication about the employee wellness program. With respect to their SOC (N = 82), 7% were in precontemplation, 16% in contemplation, 52% preparation, 5% in action, and 20% in maintenance SOC. In Phase 2, we aimed to improve readiness for participation in the program. We used SOC-based employee Facebook group messages, a health education fair, and measurement through a postintervention physical activity readiness survey. The mean number of "views" in which the workers saw the 16 theory-based messages was 12.2 (range = 0-27). Fourteen adults and 17 children attended the fair. Postintervention survey results (N = 125) indicated physical activity readiness improvement with 1% in precontemplation, 21% in contemplation, 33% in preparation, 33% in action, and 12% in maintenance SOC

Oliv S, Gustafsson E, Baloch AN, Hagberg M, and Sanden H. Workplace interventions can reduce sickness absence for persons with work-related neck and upper extremity disorders: a one-year prospective cohort study. Journal of Occupational & Environmental Medicine. 2019; 61(7):559-564.

<https://doi.org/10.1097/JOM.0000000000001608>

Abstract: **OBJECTIVE:** The objective of this study was to investigate

whether workplace interventions are effective in reducing sickness absence in persons with work-related neck and upper extremity disorders and whether disorder improvement after intervention reduces sickness absence. **METHODS:** This study was a prospective cohort study of workers with work-related neck pain or upper extremity disorders. Data were obtained from the Swedish "Work-related disorders" and "Work environment" surveys. Register data on sickness-absence 1 year after the surveys were made and obtained from the Swedish health insurance database. **RESULTS:** A significant lower number of sickness-absence days were found for workers reporting improvement after intervention. **CONCLUSION:** The findings in this study suggest that workplace intervention can reduce sickness absence for workers with neck or upper extremity disorders only if the intervention improves the disorder. The interventions were most effective in reducing medium long sickness absence periods

Orgambidez A and Almeida H. Core burnout and power in Portuguese nursing staff: an explanatory model based on structural empowerment. Workplace Health & Safety. 2019; 67(8):391-398.

<https://doi.org/10.1177/2165079918822648>

Abstract: In the nursing context, structural empowerment has proved to be an organizational tool leading to the prevention of stress and burnout. Structural empowerment is defined as the perception of the presence or absence of empowering conditions in the workplace. However, few studies have explored the particular relationships between power in organizations, structural empowerment, and burnout. The aim of this study was to examine the mediator role of structural empowerment (access to opportunities, information, support, and resources) in the relationship between formal and informal power, and core burnout among Portuguese nurses. We administered a questionnaire among a convenience sample of 304 nurses employed in public hospitals. Model fit and mediation analysis were conducted using path analysis and bootstrapping methods. Formal power, informal power, access to opportunities, and access to resources were significant and negative predictors of core burnout. Opportunities, resources, and informal power had a direct influence on core burnout. Formal power and informal power showed an indirect influence, mediated by opportunities and resources, on core

burnout. These findings suggest that by providing nurses with high levels of formal and informal power, as well as access to resources and opportunities, their risk of core burnout can be lowered

Pilecky D, Vamos M, Bogyi P, Muk B, Stauder D, Racz H, et al. Risk of cardiac arrhythmias after electrical accident: a single-center study of 480 patients. *Clinical Research in Cardiology*. 2019; 108(8):901-908.

<https://doi.org/10.1007/s00392-019-01420-2>

Abstract: OBJECTIVE: Patients with electrical injury are considered to be at high risk of cardiac arrhythmias. Due to the small number of studies, there is no widely accepted guideline regarding the risk assessment and management of arrhythmic complications after electrical accident (EA). Our retrospective observational study was designed to determine the prevalence of ECG abnormalities and cardiac arrhythmias after EA, to evaluate the predictive value of cardiac biomarkers for this condition and to assess in-hospital and 30-day mortality. METHODS: Consecutive patients presenting after EA at the emergency department of our institution between 2011 and 2016 were involved in the current analysis. ECG abnormalities and arrhythmias were analyzed at admission and during ECG monitoring. Levels of cardiac troponin I, CK and CK-MB were also collected. In-hospital and 30-day mortality data were obtained from hospital records and from the national insurance database. RESULTS: Of the 480 patients included, 184 (38.3%) had suffered a workplace accident. The majority of patients (96.2%) had incurred a low-voltage injury (< 1000 V). One hundred and four (21.7%) patients had a transthoracic electrical injury while 13 (2.7%) patients reported loss of consciousness. The most frequent ECG disorders at admission were sinus bradycardia (< 60 bpm, n = 50, 10.4%) and sinus tachycardia (> 100 bpm, n = 21, 4.4%). Other detected arrhythmias were as follows: newly diagnosed atrial fibrillation (n = 1); frequent multifocal atrial premature complexes (n = 1); sinus arrest with atrial escape rhythm (n = 2); ventricular fibrillation terminated out of hospital (n = 1); ventricular bigeminy (n = 1); and repetitive nonsustained ventricular tachycardia (n = 1). ECG monitoring was performed in 182 (37.9%) patients for 12.7 +/- 7.1 h at the ED. Except for one case with regular supraventricular tachycardia terminated via vagal maneuver and one other case with paroxysmal atrial fibrillation, no clinically

relevant arrhythmias were detected during the ECG monitoring. Cardiac troponin I was measured in 354 (73.8%) cases at 4.6 +/- 4.3 h after the EA and was significantly elevated only in one resuscitated patient. CK elevation was frequent, but CK-MB was under 5% in all patients. Both in-hospital and 30-day mortality were 0%.

CONCLUSIONS: Most of cardiac arrhythmias in patients presenting after EA can be diagnosed by an ECG on admission, thus routine ECG monitoring appears to be unnecessary. In our patient cohort cardiac troponin I and CK-MB were not useful in risk assessment after EA. Late-onset malignant arrhythmias were not observed

Schmidt B, Schneider M, Seeger P, van VA, Loerbroks A, and Herr RM. A comparison of job stress models: associations with employee well-being, absenteeism, presenteeism, and resulting costs. Journal of Occupational & Environmental Medicine. 2019; 61(7):535-544.

<https://doi.org/10.1097/JOM.0000000000001582>

Abstract: **OBJECTIVE:** This study investigates the associations between Effort-Reward-Imbalance (ERI), Overcommitment (OC), Job-Demand-Control (JDC), and Organizational Injustice (OIJ) with employee well-being, absenteeism, and presenteeism, as well as the costs incurred. **METHODS:** Cross-sectional data from 1440 German pharmaceutical company employees assessing job stress, employee well-being, absenteeism, and presenteeism were used. Linear regression and interval regression analyses assessed separate and independent associations and sample-specific costs were estimated. **RESULTS:** All four stressors were related to employee well-being, presenteeism, and absenteeism when analyzed separately. OIJ showed the strongest independent association with absenteeism (coef. = 0.89; $P < 0.01$), whereas OC was most strongly independently associated with lower well-being (coef. = -0.44; $P < 0.01$) and higher presenteeism (coef. = 0.28; $P < 0.01$). Absenteeism costs per employee/year were higher than presenteeism costs. **CONCLUSIONS:** Occupational health interventions reducing job stress will have strong potential for productivity raise and lower costs

Thomson L, Stanyon M, Denning T, Heron R, and Griffiths A. Managing employees with dementia: a systematic review. Occupational Medicine. 2019; 69(2):89-98.

<https://doi.org/10.1093/occmed/kqy161>

Abstract: **BACKGROUND:** The experience of developing dementia while in employment has been explored from the point of view of the employee, but less is known about the perspectives, experiences and needs of employers. **AIMS:** To review systematically literature about the management of employees who develop dementia whilst in employment. **METHODS:** Databases searched included MEDLINE, EMBASE, PsycINFO, CINAHL, BNI, ABI Inform, ISI Web of Science, Open Grey and dementia journals database; 44 documents were identified for inclusion in the review: 22 journal papers, one PhD thesis and 21 articles, reports and webpages from the grey literature. As all documents were qualitative in nature a thematic synthesis of their content was undertaken. **RESULTS:** Three main themes and ten sub-themes were identified. The main themes concerned early presentation and identification in the workplace; reasonable adjustments for people with working age dementia; and the provision of information to raise awareness and facilitate informed choice. The evidence suggested that there is a lack of awareness about working age dementia and that this may impact negatively on employees. Guidance for employers offered suggestions for good practice. **CONCLUSIONS:** Guidance for employers is increasingly available although it rarely refers to the evidence base. There is a need for future studies that explore the effectiveness of guidance and training initiatives for employers. Examples of good practice where employees with dementia have been well supported in the workplace and who have been able to leave the workforce with dignity, would be helpful

van Kampen V, Bruning T, and Merget R. Serial fractional exhaled nitric oxide measurements off and at work in the diagnosis of occupational asthma. American Journal of Industrial Medicine. 2019; 62(8):663-671.

<https://doi.org/10.1002/ajim.22996>

Abstract: **BACKGROUND:** Fractional exhaled nitric oxide (FeNO) before and after specific inhalation challenge has been postulated as an additional tool in the diagnosis of occupational asthma (OA), but little is known about serial FeNO measurements at home and at work. The aim of the present study was to assess the contribution of serial measurements of FeNO off and at work toward the diagnosis of OA.

METHODS: Forty-one subjects with suspected (n = 35) or diagnosed (n = 6) OA performed FeNO measurements once daily during a 2-week holiday and a subsequent 2-week work period. A work-related increase in FeNO by 20 ppb (parts per billion) or more was considered positive. Subjects with negative or doubtful specific inhalation challenge but a FeNO increase of 20 ppb or more were evaluated individually by an overall expert rating taking into account all available information. **RESULTS:** Seven of 35 subjects (20%) with suspected and three of six subjects (50%) with diagnosed OA showed a work-related FeNO increase of 20 ppb or more. Six of the seven with suspected OA were reclassified as having an OA diagnosis by the overall expert rating which also considered these FeNO changes. **CONCLUSIONS:** Serial FeNO measurements off and at work provide complementary information in the diagnosis in about one-fifth of cases with suspected OA, especially if specific inhalation challenges are negative or cannot be performed

Won G, Park JB, Lee KJ, Ha R, Lee S, and Jeong I. The association between dependent self-employment and self-reported depression/anxiety and sleep disorder in South Korea. Annals of Occupational and Environmental Medicine. 2019; 31(1):e13.

<https://doi.org/10.35371/aoem.2019.31.e13>

***IWH authored publication.**