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Journal articles marked with an asterisk indicate an IWH scientist or adjunct scientist is included in the list of authors.

***Jung Y, Longo C, and Tompa E. Longitudinal assessment of labor market earnings among patients diagnosed with cancer in Canada. *JAMA Network Open*. 2022; 5(12):e2245717. <https://doi.org/10.1001/jamanetworkopen.2022.45717> [open access]**

Abstract: Importance: To our knowledge, there have been no studies that estimated the short-, mid-, and long-term effects on cancer survivors' labor market earnings using administrative data. Objective: To estimate the change in labor market earnings due to cancer diagnosis stratified by cancer type and age category. Design, setting, and participants: This population-based cohort study used a retrospective analysis of Statistics Canada's administrative linkage file, which includes microdata from the 1991 Census, the Canadian Cancer Registry, mortality records, and personal income tax files. Participants included patients newly diagnosed with cancer from 1992 to 2008. All statistical analyses were finished on September 30, 2020. Exposures: Cancer diagnosis using the International Classification of Diseases, Ninth Revision, and the International Classification of Diseases, Tenth Revision. Main outcomes and measures: Annual and percent change in labor market earnings. The empirical strategy used a combination of the Mahalanobis distance and propensity score matching method and the difference-in-difference regression method to select a control group similar to the cancer survivors in this study and assess the association of the cancer diagnosis with labor market earnings, respectively. Results: A total of 59 532 patients with cancer and 243 446 patients without cancer were included in the main analysis. The mean (SD) age was similar between the matched treatment and control cohort (49.70 [8.1] years vs 49.68 [7.2] years), as was the proportion of females (0.49 vs 0.49), and the

individual reported income (\$37 937 [\$18 645] vs \$37 396 [\$16 876]). The results showed the negative associations of cancer with labor market earnings. Additionally, the severity of the cancer was associated with labor market earnings, where cancer survivors with a severe type of cancer in terms of the 5-year survival rate are shown to have a larger and more persistent earnings difference compared with the control group. Conclusions and relevance: The findings of this cohort study suggest that labor market earnings losses are associated with a cancer diagnosis. A better understanding of the loss of labor market earnings following cancer diagnosis and by cancer type can play an important role in starting a dialogue in future policy initiatives to mitigate the financial burden faced by cancer survivors.

Ajstrup M, Budtz CR, Nielsen KJ, Andersen DR, Andersen JH, and Christiansen DH. Musculoskeletal health climate is a prognostic determinant of sickness absence among female eldercare workers: a prospective cohort study. *Journal of Occupational & Environmental Medicine*. 2023; 65(1):e4-e9.

<https://doi.org/10.1097/JOM.0000000000002729> [open access]

Abstract: OBJECTIVES: The present study investigated the association between musculoskeletal health climate, that is, the shared perceptions among workers concerning musculoskeletal health, and sickness absence. METHODS: Questionnaire data on two domains of musculoskeletal health climate, perceived management priority (PMP) and pain acceptance at work (PAW), were collected at baseline. Data on sickness absence were extracted at 1-year follow-up. Data were analyzed using negative binomial multivariable regression. RESULTS: The final study population comprised 390 female eldercare workers. Compared with participants with low PMP scores, participants with high PMP scores had lower risk of sickness absence (incidence rate ratio, 0.6; 95% confidence interval, 0.4-0.9). Participants with high PAW scores had higher risk of sickness absence than participants with low PAW scores (incidence rate ratio, 1.4; 95% confidence interval, 0.9-2.2). CONCLUSIONS: The results showed an association between the musculoskeletal health climate and sickness absence

Braten LCH, Grovle L, Wigemyr M, Wilhelmsen M, Gjefsen E, Espeland A, et al. Minimal important change was on the lower spectrum of previous estimates and responsiveness was sufficient for core outcomes in chronic low back pain. *Journal of Clinical Epidemiology*. 2022; 151:75-87.

<https://doi.org/10.1016/j.jclinepi.2022.07.012> [open access]

Abstract: OBJECTIVES: The objective of this study was to estimate the minimal important change (MIC) and responsiveness of core patient reported outcome measures for chronic low back pain (LBP) and Modic changes. STUDY DESIGN AND SETTING: In the Antibiotics in Modic changes (AIM) trial we measured disability (RMDQ, ODI), LBP intensity (NRS) and health-related quality of life (EQ5D) electronically at baseline, three- and 12-month follow-up. MICs were estimated using Receiver Operating Curve (ROC) curve and Predictive modeling analyses against the global perceived effect. Credibility of the estimates was assessed by a

standardized set of criteria. Responsiveness was assessed by a construct and criterion approach according to COSMIN guidelines. RESULTS: The MIC estimates of RMDQ, ODI and NRS scores varied between a 15-40% reduction, depending on including "slightly improved" in the definition of MIC or not. The MIC estimates for EQ5D were lower. The credibility of the estimates was moderate. For responsiveness, five out of six hypotheses were confirmed and AUC was >0.7 for all PROMs. CONCLUSION: When evaluated in a clinical trial of patients with chronic LBP and Modic changes, MIC thresholds for all PROMs were on the lower spectrum of previous estimates, varying depending on the definition of MIC. Responsiveness was sufficient

Cowger TL, Murray EJ, Clarke J, Bassett MT, Ojikutu BO, Sanchez SM, et al. Lifting universal masking in schools: COVID-19 incidence among students and staff. *New England Journal of Medicine*. 2022; 387(21):1935-1946.

<https://doi.org/10.1056/NEJMoa2211029> [open access]

Abstract: BACKGROUND: In February 2022, Massachusetts rescinded a statewide universal masking policy in public schools, and many Massachusetts school districts lifted masking requirements during the subsequent weeks. In the greater Boston area, only two school districts - the Boston and neighboring Chelsea districts - sustained masking requirements through June 2022. The staggered lifting of masking requirements provided an opportunity to examine the effect of universal masking policies on the incidence of coronavirus disease 2019 (Covid-19) in schools. METHODS: We used a difference-in-differences analysis for staggered policy implementation to compare the incidence of Covid-19 among students and staff in school districts in the greater Boston area that lifted masking requirements with the incidence in districts that sustained masking requirements during the 2021-2022 school year. Characteristics of the school districts were also compared. RESULTS: Before the statewide masking policy was rescinded, trends in the incidence of Covid-19 were similar across school districts. During the 15 weeks after the statewide masking policy was rescinded, the lifting of masking requirements was associated with an additional 44.9 cases per 1000 students and staff (95% confidence interval, 32.6 to 57.1), which corresponded to an estimated 11,901 cases and to 29.4% of the cases in all districts during that time. Districts that chose to sustain masking requirements longer tended to have school buildings that were older and in worse condition and to have more students per classroom than districts that chose to lift masking requirements earlier. In addition, these districts had higher percentages of low-income students, students with disabilities, and students who were English-language learners, as well as higher percentages of Black and Latinx students and staff. Our results support universal masking as an important strategy for reducing Covid-19 incidence in schools and loss of in-person school days. As such, we believe that universal masking may be especially useful for mitigating effects of structural racism in schools, including potential deepening of educational inequities. CONCLUSIONS: Among school districts in the greater Boston area, the lifting of

masking requirements was associated with an additional 44.9 Covid-19 cases per 1000 students and staff during the 15 weeks after the statewide masking policy was rescinded

DiRenzo D, Saygin D, de Groot I, Bingham Iii CO, Lundberg IE, Needham M, et al. Reliability and validity of PROMIS physical function, pain interference, and fatigue as patient reported outcome measures in adult idiopathic inflammatory myopathies: international study from the OMERACT myositis working group. *Seminars in Arthritis and Rheumatism*. 2022; 58:152111.

<https://doi.org/10.1016/j.semarthrit.2022.152111>

Abstract: Objective: Pain interference, fatigue, and impaired physical function are common features of idiopathic inflammatory myopathies (IIM). The objective of this study was to evaluate the construct validity and test-retest reliability of the Patient Reported Outcome Information System (PROMIS) Pain Interference 6av1.0, Fatigue 7av1.0, and Physical Function 8bv2.0 instruments. Methods: Patient-Reported Outcome Measures (PROMs) were deployed to adult IIM patients from OMERACT Myositis Working Group (MWG) international clinic sites via two online surveys (2019, 2021). Internal consistency of each PROM was analyzed by Cronbach's α . Construct validity was determined by a priori hypotheses generated by the MWG with >75% agreement for each hypothesis and calculated with Pearson correlations. Test-retest reliability was assessed using intraclass correlation coefficient with PROMIS instruments administered at time zero and 7 days. Results: Surveys were sent to 368 participants in total; participants who completed each questionnaire varied (n=65 to 263). For construct validity, 10 out of 13 a priori hypotheses were met supporting construct validity of PROMIS instruments (Pain Interference 3/4, fatigue 4/4, and Physical Function 3/5). Test-retest reliability was strong for all PROMIS instruments. All PROMIS instruments demonstrated excellent internal consistency. None of the measures demonstrated any ceiling or floor effects except for a ceiling effect in the Pain Interference instrument. Conclusions: This study presents test-retest reliability and construct validity evidence supporting PROMIS Pain Interference (6a v1.0), Fatigue (7a v1.0), and Physical Function (8b v2.0) using a large international cohort of patients with IIM. Internal consistency of these instruments was excellent. A ceiling effect was noted in the Pain Interference instrument.

van Egmond EEA, van Gorp DAM, Jongen PJ, van der Klink JJJ, Reneman MF, Arnoldus EPJ, et al. Self-reported work productivity in people with multiple sclerosis and its association with mental and physical health. *Disability and Rehabilitation*. 2022; 44(23):7096-7105.

<https://doi.org/10.1080/09638288.2021.1981468>

Abstract: Purpose: This study aimed to identify mental health, physical health, demographic and disease characteristics relating to work productivity in people with multiple sclerosis (MS). Methods: In this cross-sectional study, 236 employed people with MS (median age = 42 years, 78.8% female) underwent neurological and neuropsychological assessments. Additionally, they completed questionnaires inquiring about work productivity (presenteeism: reduced productivity while working, and absenteeism: loss of productivity

due to absence from work), mental and physical health, demographic and disease characteristics. Multiple linear and logistic regression analyses were performed with presenteeism and absenteeism as dependent variables, respectively. Results: A model with mental and physical health factors significantly predicted presenteeism $F(11,202) = 11.33$, $p < 0.001$, $R^2 = 0.38$; a higher cognitive ($p < 0.001$) and physical impact ($p = 0.042$) of fatigue were associated with more presenteeism. A model with only mental health factors significantly predicted absenteeism; $\chi^2(11)=37.72$, $p < 0.001$, with $R^2 = 0.27$ (Nagelkerke) and $R^2 = 0.16$ (Cox and Snell). Specifically, we observed that more symptoms of depression ($p = 0.041$) and a higher cognitive impact of fatigue ($p = 0.011$) were significantly associated with more absenteeism. Conclusions: In people with MS, both cognitive and physical impact of fatigue are positively related to presenteeism, while symptoms of depression and cognitive impact of fatigue are positively related to absenteeism. Implications for rehabilitation Multiple sclerosis (MS) affects people of working age, significantly interfering with work productivity. Higher cognitive and physical impact of fatigue were associated with more presenteeism in workers with MS. A higher cognitive impact of fatigue and more depressive symptoms were associated with absenteeism in workers with MS. Occupational and healthcare professionals should be aware of the impact of both physical and mental health on work productivity in workers with MS.

Kawakami N, Sasaki N, Asaoka H, Kuroda R, Tsuno K, and Imamura K. Effects of workplace measures against COVID-19 and employees' worry about them on the onset of major depressive episodes: a 13-month prospective study of full-time employees. *Journal of Affective Disorders*. 2023; 322:187-193.

<https://doi.org/10.1016/j.jad.2022.04.040> [open access]

Abstract: Background: Workplace measures against COVID-19 may prevent the onset of major depressive episode (MDE) in the working population. This 13-month prospective study aimed to investigate the association of the number of workplace measures against COVID-19 and employees' worry about the measures on the onset of MDE during COVID-19 outbreaks in Japan. Methods: Data were collected from employees by using online questionnaires at baseline (May 2020) and the 7th survey (June 2021). The onset of MDE during the follow-up was retrospectively measured at the 7th survey, with a self-report scale based on the Mini-International Neuropsychiatric Interview according to the DSM-IV/DSM-5 criteria. Participants were asked to report the number of workplace measures against COVID-19 in their companies/organizations and their worry about these measures (scored 0-3). Multiple logistic regression was conducted of MDE on the number of workplace measures and worry about these, adjusting for demographic and work-related covariates and psychological distress at baseline. Results: Among 968 respondents employed in May 2020, 827 completed the 7th survey in June 2021 (80%). We excluded 75 respondents who reported they had an MDE in May 2020 or earlier. Worry about workplace measures was significantly associated with the onset of MDE after adjusting for the covariates (OR for 1 score increase, 1.53; 95% CI, 1.02-2.32; $p = 0.042$). No significant association was found between the number of

workplace measures and the onset of MDE. Conclusions: Worrying about workplace measures taken by company/organization may be a risk factor for the onset of an MDE among employees during the COVID-19 pandemic.

Lyu S, Hon CKH, Chan APC, Jiang X, and Skitmore M. Critical factors affecting the safety communication of ethnic minority construction workers. *Journal of Construction Engineering and Management*. 2023; 149(2):04022173.

<https://doi.org/10.1061/JCEMD4.COENG-12680>

Michel JS, Shifrin NV, Postier LE, Rotch MA, and McGoey KM. A meta-analytic validation study of the Shirom-Melamed burnout measure: examining variable relationships from a job demands-resources perspective. *Journal of Occupational Health Psychology*. 2022; 27(6):566-584.

<https://doi.org/10.1037/ocp0000334>

Abstract: Job-related burnout has become a central construct in occupational health psychology. Given the considerable emphasis on burnout in both basic research and organizational initiatives, affirming the validity of inferences from commonly used measures is imperative to explore this phenomenon. The Shirom-Melamed burnout measure (SMBM) is well grounded with strong theoretical roots stemming from conservation of resources theory to assess exhaustion across physical, cognitive, and emotional subscales. However, despite its strong theoretical foundation and consistent use to measure burnout across various disciplines, there have been no meta-analytic validation efforts of the SMBM. The goal of the present meta-analysis is to fill this gap and provide a comprehensive evaluation of the SMBM using 564 effect sizes retrieved from 100 samples (N = 53,484). Results revealed that the three subscales of physical fatigue, cognitive weariness, and emotional exhaustion all displayed strong intercorrelations and that the SMBM was stable over time, as suggested by high test-retest estimates. Relationships with demographic controls, such as age, sex, and hours worked, were low in magnitude or nonsignificant. Following a job demands-resources perspective, we examined the nomological network of the SMBM, finding strong support for associations with job and personal predictors, motivational covariates, and job and personal outcomes. These findings, inferring the construct validity of the SMBM, hold implications for future research and practice, including support for its use in organizational research and applied settings. (PsyInfo Database Record (c) 2022 APA, all rights reserved)

Norgaard B, Briel M, Chrysostomou S, Ristic Medic D, Buttigieg SC, Kiisk E, et al. A systematic review of meta-research studies finds substantial methodological heterogeneity in citation analyses to monitor evidence-based research. *Journal of Clinical Epidemiology*. 2022; 150:126-141.

<https://doi.org/10.1016/j.jclinepi.2022.06.021> [open access]

Abstract: OBJECTIVES: This systematic review aimed to identify the characteristics and application of citation analyses in evaluating the justification, design, and placement of the

research results of clinical health studies in the context of earlier similar studies. **STUDY DESIGN AND SETTING:** We searched MEDLINE (Ovid), Embase (Ovid), and the Cochrane Methodology Register for meta-research studies. We included meta-research studies assessing whether researchers used earlier similar studies and/or systematic reviews of such studies to inform the justification or design of a new study, whether researchers used systematic reviews to inform the interpretation of new results, and meta-research studies assessing whether redundant studies were published within a specific area. The results are presented as a narrative synthesis. **RESULTS:** A total of 27 studies were included. How authors of citation analyses define their outcomes appears rather arbitrary, as does how the reference of a landmark review or adherence to reporting guidelines was expected to contribute to the initiation, justification, design, or contextualization of relevant clinical trials. **CONCLUSION:** Continued and improved efforts to promote evidence-based research are needed, including clearly defined and justified outcomes in meta-research studies to monitor the implementation of an evidence-based approach

Pischel S and Felfe J. "Should I tell my leader or not? "-Health-oriented leadership and stigma as antecedents of employees' mental health information disclosure intentions at work. *Journal of Occupational & Environmental Medicine*. 2023; 65(1):74-85.

<https://doi.org/10.1097/JOM.0000000000002688>

Abstract: **OBJECTIVE:** To investigate how health-oriented leadership and stigma facilitate or impede employees' disclosure intentions to leaders. **METHODS:** In two studies-an experimental vignette (n = 73) and a cross-sectional study (n = 220)-we manipulated or measured health-oriented leadership, transformational leadership, and organizational stigma and compared different reasons for disclosure (mental health problems and severe error) to separate general and specific disclosure decisions. **RESULTS:** Health-oriented leadership fostered disclosure above and beyond transformational leadership. High organizational stigma was associated with lower disclosure. Health-oriented leadership had a stronger effect on disclosing mental problems than on disclosing a severe error and slightly mitigated the negative relationship between stigma and disclosure in study 1. Findings were not influenced by employees' current mental health status. **CONCLUSIONS:** Our findings highlight the importance of health-oriented leadership as a facilitator and organizational stigma as a barrier to disclosure intentions

Reilly MJ, Wang L, and Rosenman KD. Evaluation of the characteristics of workers injured on the job requiring hospitalization, and employer compliance with OSHA's reporting requirement for these work-related hospitalizations. *American Journal of Industrial Medicine*. 2023; 66(2):109-121.

<https://doi.org/10.1002/ajim.23447>

Abstract: **Background:** The Occupational Safety and Health Administration (OSHA) implemented a new standard in 2014 requiring employers to report nearly all work-related inpatient hospitalizations within 24 h of the event. We examined the characteristics of the

injured workers who were reported and the compliance of Michigan employers with the regulation. Methods: From 2016 to 2018, we compared reports of acute nonmotor-vehicle work-related injuries and illnesses from two independent datasets, employer reports to OSHA and the Michigan Multi-Source Injury and Illness Surveillance System (MMSIIS) which collects injured worker hospital records from the 134 hospitals in Michigan. We matched records from employer reports to OSHA with the MMSIIS by employee's first and last name, company name, date of injury/illness, and type of injury/illness. Results: We identified 2887 workers hospitalized with severe injuries/illnesses from 2016 to 2018 in Michigan; 1260 workers were reported by employers to OSHA and 2238 workers were reported by hospitals to the MMSIIS. There was an overlap of 611 workers reported in both systems, while 649 workers were only reported by employers to OSHA and 1627 workers were only reported by hospitals to the MMSIIS. Employer compliance with the regulation over the 3 years showed a nonsignificant increase; from 42.0% to 43.6% to 45.0%. Fractures were the most frequent type of injury (1238, 42.9%), then head injuries, including skull fractures (470, 16.3%). The median length of hospital stay was 3 days. Manufacturing (709, 25.5%) and construction (563, 20.3%), accounted for the greatest number of hospitalizations. Employer-reported cases to OSHA significantly undercounted hospitalized workers in agriculture, forestry, fishing, and hunting; construction; finance and insurance; real estate and rental and leasing; administrative and support and waste management and remediation services; arts, entertainment, and recreation; accommodation and food services; and other services except public administration. Companies with 250 or more employees were significantly more likely to comply and small companies with 10 or fewer employees were significantly less likely to comply with the reporting rule. Enforcement inspections at 465 of the workplaces where a hospitalization had occurred resulted in \$1,017,835 in fines and identified 608 violations. Of the 465 inspections, 246 (52.9%) of the employers had not corrected the hazard before the inspection. Conclusions: This study identified that workers sustained severe injuries and illnesses on the job and that over half of the companies where a worker suffered an injury/illness leading to hospitalization were not in compliance with OSHA's reporting regulation. Furthermore, at the time of an inspection 1-5 months later, 50% of the companies had not corrected the hazard causing the hospitalization. Improvement in the reporting of work-related injuries/illnesses that result in hospitalization will identify more ongoing hazards in the workplace and improve where to focus preventive actions.

De Roos AJ, Fritschi L, Ward MH, Monnereau A, Hofmann J, Bernstein L, et al. Herbicide use in farming and other jobs in relation to non-Hodgkin's lymphoma (NHL) risk. *Occupational & Environmental Medicine*. 2022; 79(12):795-806.

<https://doi.org/10.1136/oemed-2022-108371> [open access]

Abstract: Objectives: Given mixed evidence for carcinogenicity of current-use herbicides, we studied the relationship between occupational herbicide use and risk of non-Hodgkin's lymphoma (NHL) in a large, pooled study. Methods: We pooled data from 10 case-control studies participating in the International Lymphoma Epidemiology Consortium, including

9229 cases and 9626 controls from North America, the European Union and Australia. Herbicide use was coded from self-report or by expert assessment in the individual studies, for herbicide groups (eg, phenoxy herbicides) and active ingredients (eg, 2,4-dichlorophenoxyacetic acid (2,4-D), glyphosate). The association between each herbicide and NHL risk was estimated using logistic regression to produce ORs and 95% CIs, with adjustment for sociodemographic factors, farming and other pesticides. Results: We found no substantial association of all NHL risk with ever-use of any herbicide (OR=1.10, 95% CI: 0.94 to 1.29), nor with herbicide groups or active ingredients. Elevations in risk were observed for NHL subtypes with longer duration of phenoxy herbicide use, such as for any phenoxy herbicide with multiple myeloma (>25.5 years, OR=1.78, 95% CI: 0.74 to 4.27), 2,4-D with diffuse large B-cell lymphoma (>25.5 years, OR=1.47, 95% CI: 0.67 to 3.21) and other (non-2,4-D) phenoxy herbicides with T-cell lymphoma (>6 years, lagged 10 years, OR=3.24, 95% CI: 1.03 to 10.2). An association between glyphosate and follicular lymphoma (lagged 10 years: OR=1.48, 95% CI: 0.98 to 2.25) was fairly consistent across analyses. Conclusions: Most of the herbicides examined were not associated with NHL risk. However, associations of phenoxy herbicides and glyphosate with particular NHL subtypes underscore the importance of estimating subtype-specific risks.

Shooshtari S, Menec V, Stoesz BM, Bhajwani D, Turner N, and Piotrowski C. Examining associations between work-related injuries and all-cause healthcare use among middle-aged and older workers in Canada using CLSA data. *Journal of Safety Research*. 2022; 83:371-378.

<https://doi.org/10.1016/j.jsr.2022.09.012>

Abstract: Introduction: Prior studies examining the relationship between work-related injuries and healthcare use among middle-aged and older workers were mainly cross-sectional and reported inconsistent results. Objective: The objective of this study was to examine the associations between work-related injuries and 10 types of healthcare service use for any cause among middle-aged and older Canadian workers using longitudinal data. Methods: Our study involved longitudinal analysis of baseline and 18-month follow-up Maintaining Contact Questionnaire data from the Canadian Longitudinal Survey on Aging (CLSA) for a national sample of Canadian males and females aged 45-85 years who worked or were recently retired (N = 24,748). Results: Among CLSA participants who worked or were recently retired, 361 per 10,000 reported a work-related injury within the year prior to the survey. Work-related injuries decreased with increasing age. Work-related injury was associated with emergency department visits, overnight hospitalization, visits to dentists, and visits to physiotherapists, occupational therapists, or chiropractors at follow-up in bivariate analyses. Compared to those with no work-related injuries, Canadians with work-related injuries had used, on average, a significantly higher number of health services within the last 12 months prior their survey. When controlling for the contribution of various socio-demographic, work-related, and health-related characteristics, work-related injuries remained a significant predictor of emergency department visits and visits to

physiotherapists, occupational therapists, or chiropractors. Conclusions: The relationship between work-related injuries, emergency department visits, and visits to physiotherapists, occupational therapists, or chiropractors in middle-aged and older workers in Canada suggests that workplace injuries can be associated with ongoing health problems. Practical applications: Healthcare services used by injured employees must be considered priorities for employment insurance coverage, if not already covered. Future research should more fully examine whether pre-existing health conditions predict both work-related injury and subsequent health problems. Injury-specific healthcare use following work-related injuries in middle-aged and older workers, as well as economic costs, should also be examined.

Zhai P, Wang J, and Zhang L. Extracting worker unsafe behaviors from construction images using image captioning with deep learning-based attention mechanism. *Journal of Construction Engineering and Management*. 2023; 149(2):04022164. <https://doi.org/10.1061/JCEMD4.COENG-12096>

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