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***Jessiman-Perreault G, Smith PM, and Gignac MAM. Why are workplace social support programs not improving the mental health of Canadian correctional officers? An examination of the theoretical concepts underpinning support. *International Journal of Environmental Research and Public Health*. 2021; 18(5):2666. <https://doi.org/10.3390/ijerph18052665> [open access]**

Abstract: In Canada, public safety personnel, including correctional officers, experience high rates of mental health problems. Correctional officers' occupational stress has been characterized as insidious and chronic due to multiple and unpredictable occupational risk factors such as violence, unsupportive colleagues and management, poor prison conditions, and shift work. Given the increased risk of adverse mental health outcomes associated with operational stressors, organizational programs have been developed to provide correctional officers with support to promote mental well-being and to provide mental health interventions that incorporate recovery and reduction in relapse risk. This paper uses two theories, the Job Demand Control Support (JDCS) Model and Social Ecological Model (SEM), to explore why workplace social support programs may not been successful in terms of uptake or



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effectiveness among correctional officers in Canada. We suggest that structural policy changes implemented in the past 15 years have had unintentional impacts on working conditions that increase correctional officer workload and decrease tangible resources to deal with an increasingly complex prison population. Notably, we believe interpersonal support programs may only have limited success if implemented without addressing the multilevel factors creating conditions of job strain

***Rahim A, McIsaac MA, Aronson KJ, Smith PM, and Tranmer JE. The associations of shift work, sleep quality, and incidence of hypertension in Ontario adults: a population-based study. Canadian Journal of Cardiology. 2021; 37(3):513-518.**

<https://doi.org/10.1016/j.cjca.2020.09.003>

Abstract: BACKGROUND: Relatively few population-based studies have explored the relationship and potential mechanisms between exposure to shift work and hypertension. The study objectives for this study were to determine 1) if history of shift work was associated with increased rates of hypertension among working adults, and 2) if sleep quality mediated this relationship. METHODS: We conducted a population-based cohort study using data from Ontario respondents (aged 35-69 y) in the 2000-2001 Canadian Community Health Survey, which was linked to administrative health data housed at the Institute for Clinical Evaluative Sciences. Our sample included survey participants who were employed with no previous diagnosis of hypertension (n= 7420). During a 12-year follow-up window, we determined the time of hypertension diagnosis based on a previously validated algorithm; and explored the mediating effect of sleep quality using marginal structural effect models. RESULTS: The study sample included 2079 shift workers and 5341 day workers. Shift workers reported less refreshing sleep, more trouble sleeping, and poorer sleep quality overall compared with day workers. In 12 years of follow-up, 31.3% of workers developed hypertension. History of shift work was associated with higher hypertension rates in both men (hazard ratio [HR] 1.21, 95% confidence interval [CI] 1.02-1.44) and women (HR 1.26, 95% CI 1.03-1.55). There was no evidence that these associations were mediated by past sleep quality. CONCLUSIONS: History of shift work schedules is associated with increased rates of hypertension. Shift work disrupts sleep, but further



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longitudinal studies are needed to determine if sleep quality mediates the association between shift work and hypertension

***Sears JM, Fulton-Kehoe D, and Hogg-Johnson S. Initial return to work and long-term employment patterns: associations with work-related permanent impairment and with participation in workers' compensation-based return-to-work programs. American Journal of Industrial Medicine. 2021; [epub ahead of print].**

<https://doi.org/10.1002/ajim.23233>

Abstract: Background: Roughly 10% of injured workers experience work injuries that result in permanent impairment and a permanent partial disability (PPD) award. This study aimed to characterize and quantify long-term employment outcomes for injured workers, by the degree of whole body impairment (WBI) and by participation in several workers' compensation (WC)-based return-to-work (RTW) programs. Methods: A retrospective cohort of 43,968 Washington State workers were followed for up to 10 years after WC claim closure (2009-2017). Degree of impairment was classified as: (1) no PPD award, (2) PPD award with WBI < 10%, or (3) PPD award with WBI = 10%. State wage files were used to construct employment outcomes for regression, modeling: (1) time to first RTW, (2) time to first RTW interruption, (3) RTW volatility, and (4) employment gaps. Results: Wage patterns and employment outcomes differed significantly by the degree of impairment. Compared to other workers, workers with WBI = 10% had delayed RTW, shorter average times to first RTW interruption, and higher rates of both RTW interruptions and quarters without wages. Time to first RTW averaged over a year, increasing with the degree of impairment. About 9% overall-and 27% of workers with =10% WBI-had no observed wages after claim closure. In adjusted models, workers with WBI = 10% had significantly poorer employment outcomes, compared to workers with no PPD award ($p < 0.001$). Conclusions: State wage files provide an efficient approach to identifying RTW patterns. Workers with permanent impairment were at substantially higher risk of poor employment outcomes. WC-based RTW programs may promote better employment outcomes.



Bush AM, Bunn TL, and Liford M. Identification of work-related injury emergency department visits using International Classification of Diseases, Tenth Revision, Clinical Modification (ICD-10-CM) codes. Injury Prevention. 2021; 27(S1):i3-i8.

<https://doi.org/10.1136/injuryprev-2019-043507> [open access]

Abstract: INTRODUCTION: Emergency department (ED) visit discharge data are a less explored population-based data source used to identify work-related injuries. When using discharge data, work-relatedness is often determined by the expected payer of workers' compensation (WC). In October 2015, healthcare discharge data coding systems transitioned to the International Classification of Diseases, Tenth Revision, Clinical Modification (ICD-10-CM). ICD-10-CM's structure offers potential new work-related codes to enhance work-related injury surveillance. This study identified work-related ED visits using relevant ICD-10-CM work-related injury codes. Cases identified using this method were compared with those identified using the WC expected payer approach. METHODS: State ED visit discharge data (2016-2019) were analysed using the CDC's discharge data surveillance definition. Injuries were identified using a diagnosis code or an external cause-of-injury code in any field. Injuries were assessed by mechanism and expected payer. Literature searches and manual review of ICD-10-CM codes were conducted to identify possible work-related injury codes. Descriptive statistics were performed and assessed by expected payer. RESULTS: WC was billed for 87 361 injury ED visits from 2016 to 2019. Falls were the most frequent injury mechanism. The 246 ICD-10-CM work-related codes identified 36% more work-related ED injury visits than using WC as the expected payer alone. CONCLUSION: This study identified potential ICD-10-CM codes to expand occupational injury surveillance using discharge data beyond the traditional WC expected payer approach. Further studies are needed to validate the work-related injury codes and support the development of a work-related injury surveillance case definition

Caban-Martinez AJ, Hughes J, and Bator C. A total worker health approach to skin exposure assessment: experiences from the firefighter cancer initiative. Annals of Work Exposures and Health. 2021; 65(2):143-147.

<https://doi.org/10.1093/annweh/wxaa066>



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Abstract: Increasing scientific evidence suggests that addressing complex, wide-ranging concerns among worker populations should include the integration of traditional occupational safety and health with often siloed worksite wellness programs. The Total Worker Health (TWH) approach developed by the National Institute for Occupational Safety and Health can support skin cancer prevention efforts by integrating organizational-level policies, programs, and practices that strategically merge both skin protection from work-related safety and health hazards with promotion of skin illness prevention efforts. In the firefighter workforce, epidemiologic studies suggest an increased risk of skin cancer despite the use of personal protective equipment during fire incident response. Mechanisms for dermal absorption of carcinogenic compounds such as polycyclic aromatic hydrocarbons have given insight into how these hazardous chemicals can enter the skin and increase cancer risk. Mitigation of carcinogenic exposures requires a TWH approach that merges skin protection and promotion, routine surveillance, skin health assessment, worksite-based interventions, and regular evaluation of program activities. In this commentary, an example of a TWH approach is provided from the Firefighter Cancer Initiative (FCI), a transdisciplinary initiative focused at addressing excess burden of cancer in the firefighter workforce. The FCI builds on the TWH approach through the following components: (i) organizational leadership commitment; (ii) elimination of workplace hazards and promotion of worker well-being; (iii) engagement of workers in program design and delivery; (iv) ensuring confidentiality and privacy in program participation; and (v) integrating systems effectively. Occupational hygienists have strong potential to play a crucial role beyond traditional risk assessment, exposure assessment, and health protection that further includes skin health promotion and integration of related programs into a TWH framework

Cherrie JW, Nioi A, Wendelboe-Nelson C, Cowan S, Cherrie M, Rashid S, et al. Exposure to solar UV during outdoor construction work in Britain. *Annals of Work Exposures and Health*. 2021; 65(2):176-182.

<https://doi.org/10.1093/annweh/wxaa028>

Abstract: Excessive exposure to ultraviolet (UV) radiation from the sun in summer can cause skin cancer and in Britain there are around



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1500 new cases of non-melanoma skin cancer (NMSC) each year, caused by exposure to solar UV at work. Little is known about the magnitude of UV exposure amongst outdoor construction workers in Britain, although this is one of the main groups at risk. The aim of this paper is to summarise measurements of erythema-weighted UVB radiation amongst construction workers in Scotland and the Southeast of England and interpret the data in terms of the risk of NMSC. The measurements were made as part of an intervention study using short mobile phone text messages to alter worker behaviour to either reduce UV exposure in summer or increase serum vitamin D in winter; the intervention is only briefly reported here. Data were collected from 67 workers from 9 worksites, of whom 41 provided measures of UV exposure for 758 working days. Daily exposure ranged from 0 to 13.47 standard erythema dose (SED), with the mean exposure for outdoor workers being 2.0 SED and the corresponding value for indoor workers being 0.7 SED. These data were obtained from a sensor located on the back of the workers hard hat; others have measured exposure on the wrist or upper arm and these locations probably, on average, have higher levels of UV exposure. It is likely that an outdoor construction worker in Britain could accumulate sufficient solar UV exposure over 30-40 years of work to more than double their risk of NMSC. We argue that employers in Britain should take a more proactive approach to manage sun safety and they should take responsibility for skin health surveillance for their workers

Chomem P and Motter AA. Analysis of physical and physiological workloads of nursing in the surgical center. Work. 2021; 68(2):425-435.

<https://doi.org/10.3233/WOR-203383>

Abstract: BACKGROUND: Operating room nursing professionals are exposed to different workload. It is necessary to recognize which situations resulting from their tasks interfere with the health of the professional. OBJECTIVES: We aimed to identify the physical and physiological loads on operating room nurses and their impact on the health as well as trace ergonomic recommendations based on the literature and performed analysis. METHODS: The is an exploratory, observational, descriptive research conducted in the surgical center of a university hospital between August 2017 and July 2018. Nursing



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staff of both genders who worked as transport professionals or room circulators were included in the study. Data collection in the OR went through stages of Ergonomic Workplace Analysis (EWA), through semi-structured interviews addressing the physical and physiological work issues and a worksheet of data collected from the observations of the practitioners' actions. RESULTS: The study included 20 nursing workers of both genders with an average of 17.33±12.58 years of work experience. The most reported problematic factors were: lack of material, staff pressure, patient transporting, employment legal status with the institution, and lack of communication among the practitioners. CONCLUSIONS: There was a physical effort during the activity and a high prevalence of workers with pain complaints, which justifies the investigation

Eftedal M, Tveito TH, Gensby U, Islam MK, Lie SA, Aasland G, et al. Comparing two interdisciplinary occupational rehabilitation programs for employees on sick leave: a mixed-method design study protocol. BMC Musculoskeletal Disorders. 2021; 22(1):158. <https://doi.org/10.1186/s12891-021-03994-3> [open access]

Abstract: BACKGROUND: Musculoskeletal disorders (MSDs) and common mental disorders (CMDs) are the most frequent reasons for long-term sick leave and work disability. Occupational rehabilitation programs are used to help employees return to work (RTW). However, knowledge regarding the effect of these programs is scarce, and even less is known about which programs are best suited for which patients. This study aims to compare the RTW results of two interdisciplinary occupational rehabilitation programs in Norway, as well as to examine the delivery and reception of the two programs and explore the active mechanisms of the participants' RTW processes. METHODS/DESIGN: We will use a mixed-method convergent design to study the main outcome. Approximately 600 participants will be included in the study. Eligible study participants will be aged 18-60 years old and have been on sick leave due to MSDs, CMDs, or both for at least 6 weeks. Interdisciplinary teams at both participating clinics will deliver complex occupational rehabilitation programs. The inpatient rehabilitation program has a duration of 4 weeks and is full time. The outpatient program has a duration of 3 months and involves weekly sessions. The primary outcome is RTW. Secondary outcomes are differences in the



incremental cost for an averted sick leave day, cost utility/benefit, and differences between the programs regarding improvements in known modifiable obstacles to RTW. Subgroup analyses are planned. The researchers will be blinded to the intervention groups when analyzing the quantitative RTW data. DISCUSSION: This study aims to provide new insights regarding occupational rehabilitation interventions, treatment targets, and outcomes for different subgroups of sick-listed employees and to inform discussions on the active working mechanisms of occupational rehabilitation and the influence of context in the return-to-work process. TRIAL REGISTRATION: Current controlled trials ISRCTN12033424 , 15.10.2014, retrospectively registered

Fraeulin L, Holzgreve F, Haenel J, Filmann N, Schmidt H, Bader A, et al. A device-based stretch training for office workers resulted in increased range of motion especially at limited baseline flexibility. Work. 2021; 68(2):353-364.

<https://doi.org/10.3233/WOR-203273>

Abstract: Background: It is unclear whether and under which conditions stretch training programs lead to gains in flexibility when applied in work health promotion for office workers in order to reduce musculoskeletal disorders (MSD). Objective: The aim of this study was to analyze whether the stretch training "five-Business" leads to gains in range of motion (ROM). Furthermore, the influence of baseline flexibility and socio-demographic factors (sex, age, weight, height and body mass index (BMI)) on trainability was assessed. Methods: 161 office workers (n = 45 female; n = 116 male) without major MSD were recruited. Over three months, a standardized static stretch training ("five-Business") was executed on a device, supervised twice per week for 10 min. ROM was assessed using a digital inclinometer (shoulder, hip and trunk extension) and a tape measure (fingertip-to-floor and lateral inclination). Results: ROM gains (p=0.001) were present in all tests, except for the hip extension. ROM changes correlated moderately (0.24-0.62) with the baseline flexibility (p=0.001). Subjects with limited flexibility reached the largest gains (1.41-25.33%). Regarding the socio-demographic factors only one low correlation occurred (weight - retroflexion; - 0.177). Conclusion: The "five-Business" stretch training effectively



increases ROM in office workers, especially when baseline flexibility is limited.

Holness DL, Kudla I, DeKoven JG, and Skotnicki S. The utility of an occupational contact dermatitis patch test database in the analysis of workplace prevention activities in Toronto, Canada. *Annals of Work Exposures and Health*. 2021; 65(2):196-200.

<https://doi.org/10.1093/annweh/wxaa077>

Abstract: **BACKGROUND:** Occupational skin diseases are common suggesting that there are still gaps in workplace prevention. Patch test surveillance systems provide an opportunity to collect work related information in addition to clinical information and patch test results. **OBJECTIVES:** To examine 5 years of data related to workplace prevention by industry sector in a patch test surveillance database for workers with a diagnosis of occupational contact dermatitis. **METHODS:** The study was approved by the Research Ethics Board of St Michael's Hospital. Information including demographics, clinical history, healthcare utilization, and workplace characteristics and prevention practices in addition to patch test results was collected from consenting patients. **RESULTS:** Workers in the healthcare and manufacturing sectors were more likely to report workplace training including skin protection training, whereas those in services and construction were less likely to report training. **CONCLUSIONS:** Collecting basic workplace information with patch test surveillance databases can inform the occupational health and safety system about prevention practices in the workplace and identify areas for focussed intervention

Jonsson J, Matilla-Santander N, Kreshpaj B, Orellana C, Johansson G, Burstrom B, et al. Exploring multidimensional operationalizations of precarious employment in Swedish register data: a typological approach and a summative score approach. *Scandinavian Journal of Work, Environment & Health*. 2021; 47(2):117-126.

<https://doi.org/10.5271/sjweh.3928> [open access]

Abstract: Objectives This study aimed to explore multidimensional operationalizations of precarious employment (PE) in Swedish register data using two approaches: (i) a typological approach and (ii) a dimensional, summative scale approach. It also examined the



distribution of sociodemographic and occupational characteristics of precarious employees in Sweden. Method Register data was retrieved on individuals and their employers in the Swedish workforce. Five items corresponding to three dimensions of PE were operationalized: contractual relationship insecurity, contractual temporariness, multiple jobs/sectors, income level, and lack of unionization. First, latent class analysis was applied and a typology of six employment types emerged. Second, a summative scale was constructed by scoring all PE-items. Results Three types of PE were found using the typological approach, which were characterized by direct employment, solo self-employment and multiple job holding, respectively. The summative scale score ranged between -10 and +2 (average: -1.8). Particularly poor scores were seen for solo self-employed, multiple job holders/multiple sectors, and low income. Female gender, young age, low education and foreign origin were prone to precariousness. PE was more frequent among certain economic sectors and occupations. Conclusions Using an existing register of labor market data, two operationalizations of PE were constructed and rendered promising for exposure assessment. Hence, the operationalizations could be of interest for countries with similar data structure. Both approaches highlighted precarious combinations of employment conditions and pointed towards the existence of a wide continuum of precariousness on the labor market. Etiological studies and research assessing trends over time are needed to validate these findings

Karimpour S, Jahani F, and Shirali GA. The relationship between safety attitude and safety performance in the petrochemical industry: the mediating role of safety climate. Work. 2021; 68(2):507-517.

<https://doi.org/10.3233/WOR-203353>

Abstract: BACKGROUND: This study aimed to investigate the relationship between safety attitudes and safety performance considering the mediating role of safety climate in the petrochemical industry. METHOD: The statistical population of this study included all 1700 employees in the petrochemical industry of Iran, among whom 320 were randomly selected as the participants and completed the research questionnaire. Then, the validity (content, convergent, and divergent) and reliability (Cronbach's alpha and composite reliability)



of the instrument were examined, and the research hypotheses were tested using Smart partial least squares (PLS) software. RESULTS: The results showed that the model has goodness of fit and, thereby, the positive effect of safety attitude on safety performance was confirmed. In addition, the mediating role of safety climate in the relationship between safety attitude and safety performance was proved. That is, 39.6% of the total effect of safety attitude on safety performance was explained through the mediating role of safety climate. CONCLUSION: The findings of this study can improve safety culture and bring about excellent safety performance in petrochemical industries

Lindsay S, Osten V, Rezai M, and Bui S. Disclosure and workplace accommodations for people with autism: a systematic review. Disability and Rehabilitation. 2021; 43(5):597-610.

<https://doi.org/10.1080/09638288.2019.1635658>

Abstract: Purpose: The objective of this systematic review was to describe the prevalence and processes of disability disclosure for persons with autism spectrum disorder. Methods: Systematic searches of seven international databases revealed 26 studies meeting our inclusion criteria. We analyzed these studies with respect to participant demographics, methodology, results and quality of the evidence. Results: Among the 26 studies, 7006 participants (aged 13-75, mean 28.1 years) were represented across seven countries. Our findings showed that rates of disclosure and receiving workplace accommodations varied considerably. Benefits of disclosing in the workplace included greater acceptance and inclusion, receiving accommodations, and increasing awareness about autism. Limitations of disclosing to employers involved experiencing stigma and discrimination. Factors affecting decisions to disclose included age at diagnosis, social demands of the job, and workplace policies. Types of accommodations that were received or desired included adjustments to the job interview process, schedules (i.e., flexibility, working from home), job content or working conditions, environment (i.e., lighting, quiet space); support with communication and social skills; and disability awareness training for their workplace colleagues. Conclusions: Our findings highlight that disclosing a condition of autism in the workplace and requesting accommodations



is complex. More research is needed to explore processes of disclosing and accommodation and how these processes vary by autism sub-type, gender, and industry type. Implications for rehabilitation Clinicians and vocational Counselors should support people with autism to advocate for their needs in the workplace, including the potential benefits of disclosing their conditions so they can access accommodations that allow them to keep healthy and productive in workplace. Clinicians should recognize that people with autism spectrum disorder may have different workplace accommodation needs than those with other types of disabilities, in particular support with social and communication skills. Clinicians should aid people with autism to access resources and supports that are available to them to access workplace accommodations.

Moldovan HR, Manole I, Suru A, Butacu AI, Tatu AL, Lupu A, et al. Prevention of hand eczema among nurse apprentice (PREVEDERM): an interventional study. Annals of Work Exposures and Health. 2021; 65(2):167-175.

<https://doi.org/10.1093/annweh/wxaa122>

Abstract: BACKGROUND: Workers in the healthcare sector are at high risk of developing occupational hand eczema mainly due to frequent exposure to irritants and/or allergens. Amongst workers in healthcare, nurses are at higher risk of developing hand dermatitis. OBJECTIVES: To evaluate the effectiveness of a short educational intervention program in preventing occupational hand eczema in nurse apprentices, using two objective tools, namely TEWL and EH, and the HECSI score. METHODS: Data regarding professions, wet work exposure, activities performed during working hours, self-reported eczema were collected from 230 nurse students, divided in two study groups: the intervention and the control group (CG). The intervention group (IG) was given education about risks and proper skin care and was provided with cosmeceuticals to be used for skin care during hospital activity. The evaluation of skin properties was performed using questionnaires, HECSI score, measurement of transepidermal water loss (TEWL) and epidermal hydration (EH). RESULTS: A number of 139 apprentice nurses completed the study. Of those participants who completed the study, 19.1% from CG and 19.6% from IG reported, at T1, hand eczema in the last 3 months, while at T2 (3 months later), 59.52 % of the CG and only 11.34 %



from the IG stated having eczema in the last 3 months. In the IG, results showed an improvement of CM with 17% and of TEWL with 16%, with only a 0.5% improvement of CM in CG and a marked impairment of TEWL by 33%. **CONCLUSION:** Hand eczema is a common occupational dermatosis affecting the medical staff, even during apprenticeship. Early preventive training programs are effective in reducing the burden of occupational contact dermatitis

Norval M, Zare M, Brunet R, Coutarel F, and Roquelaure Y. Contribution of situational operational leeway for ergonomic assessment in the evaluation of work situations. Theoretical Issues in Ergonomics Science. 2021; 22(2):139-160.

<https://doi.org/10.1080/1463922X.2020.1785039>

Stuber F, Seifried-Dubon T, Rieger MA, Gundel H, Ruhle S, Zipfel S, et al. The effectiveness of health-oriented leadership interventions for the improvement of mental health of employees in the health care sector: a systematic review. International Archives of Occupational & Environmental Health. 2021; 94(2):203-220.

<https://doi.org/10.1007/s00420-020-01583-w> [open access]

Abstract: **PURPOSE:** An increasing prevalence of work-related stress and employees' mental health impairments in the health care sector calls for preventive actions. A significant factor in the workplace that is thought to influence employees' mental health is leadership behavior. Hence, effective leadership interventions to foster employees' (leaders' and staff members') mental health might be an important measure to address this pressing issue. **METHODS:** We conducted a systematic review according to the PRISMA statement (Liberati et al. 2009) and systematically searched the following databases: PubMed (PMC), Web of Science, PsycINFO (EBSCOhost), EconLit (EBSCOhost), and Business Source Premier (EBSCOhost). In addition, we performed a hand search of the reference lists of relevant articles. We included studies investigating leadership interventions in the health care sector that aimed to maintain/foster employees' mental health. **RESULTS:** The systematic search produced 11,221 initial search hits in relevant databases. After the screening process and additional literature search, seven studies were deemed eligible according to the inclusion criteria. All



studies showed at least a moderate global validity and four of the included studies showed statistically significant improvements of mental health as a result of the leadership interventions.

CONCLUSIONS: Based on the findings, leadership interventions with reflective and interactive parts in group settings at several seminar days seem to be the most promising strategy to address mental health in health care employees. As the available evidence is limited, efforts to design and scientifically evaluate such interventions should be extended

Xia N, Tang Y, Li D, and Pan A. Safety behavior among construction workers: influences of personality and leadership. Journal of Construction Engineering and Management. 2021; 147(4):04021019.

[https://doi.org/10.1061/\(ASCE\)CO.1943-7862.0002023](https://doi.org/10.1061/(ASCE)CO.1943-7862.0002023)

*IWH Authored publications.



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