Results The overview reveals that the external eye physiology (separate from internal eye effects), eye diseases (evaporative dry eye, aqueous-deficient dry eye, and gland dysfunctions) aggravate the stability of precorneal tear film (PTF); this appears to cause hyperosmolarity and initiation of inflammatory reactions. Further, indoor environmental, occupational and personal risk factors may aggravate the PTF stability. These are, inter alia age, contact lenses, cosmetics, diet, draft, gender, low humidity and high temperature, medication, outdoor and combustion pollutants, and VDU work. Psychological stressors may further influence the reporting behaviour of symptoms. The risk factor impact may occur in a combined and exacerbating manner.

Discussion Multifactorial causalities show two key indoor parameters, visually demanding tasks combined with low relative humidity. A substantial fraction of office workers may have unrecognised DE diseases which may further be exacerbated by environmental, occupational and personal risk factors. Dry eye-like related symptoms in office-like environments may be considered a subgroup of 'dry eye' disease.

A number of other risk factors in the office environment are associated with reported DE symptoms. These may in combination exacerbate the symptom reporting. Except for combined events, indoor VOCs, formaldehyde, and acrolein are not expected to cause sensory-related eye symptoms in offices without aggravation of the PTF.

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THE CONTRIBUTION OF TASK- AND WORKER-RELATED ACCOMMODATION TO ASTHENIOPIA: A CRITICAL LITERATURE REVIEW

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10.1136/oemed-2018-ICOHabstracts.1528

Introduction Near work is believed to be a key factor in the development of occupational asthenopia as well as being a possible cofactor for the development of adult myopia. Prolonged viewing distances of less than one metre induce visual symptoms by imposing a sustained contraction of ciliary muscles. Small screens on mobile devices are very common in modern work environments, and there are many jobs and tasks that require near work every day. Furthermore, there is an ageing workforce where there is less capacity for visual accommodation. This review critically assesses the published literature on asthenopia attributable to task observation distance and worker-related accommodative capacity.

Methods A systematic search of PubMed, Scopus, and Embase was used, and supplemented with forwards, backwards and hand-searching, including by author. The major search terms were 'observation distance', 'near work' and 'visual work load'.

Results Most published papers reporting on asthenopia in the workplace classify visual effort in broad terms, without objective 'on site' measurement of task-determined visual distances/durations. Similarly, few papers separately consider workers over 45 (presbyopia), and those who are long sighted (hyperopia), where there is a greater requirement of accommodation compared to normal sighted (emmetropes). Even fewer papers juxtapose the observation distance with the worker capacity for accommodation, i.e. combining exposure and susceptibility, which is essential for the characterisation of asthenopia risk.

Discussion In order to assess and manage risks for asthenopia attributable to visual effort, equal weight should be given to task and individual factors. Future studies should utilise objective measurements of task viewing distance and durations. Currently, there is a need for a personal monitoring device that can continuously measure and datalog these parameters. With regard to an ageing workforce, intervention research is needed to determine whether the provision of larger screens, larger images and less visual demanding software reduces asthenopia.

1405

IS HEAVY VDT USE A RISK FOR VISUAL FIELD ABNORMALITIES AMONG JAPANESE WORKERS?

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10.1136/oemed-2018-ICOHabstracts.1529

Introduction The rapid global spread of information technology (IT), and most recently of new media (e.g., smartphones and tablets), has continually increased exposure to visual display terminals (VDT). This exposure is particularly marked among general workers. The health issues related to long-time VDT use are of great concern. Our previous large-scale, population-based study using frequency doubling technology perimetry (FDT) perimetry in the workplace indicated a possible association between a history of VDT use and glaucoma. Interestingly, we observed a significant interaction effect of myopia on the association between computer use and glaucoma; specifically, an increased risk of glaucomatous visual field abnormality (VFA) was observed only among frequent VDT users with myopia (*J Epidemiol Community Health*, 2004;58(12):1021–7. etc.). However, those studies featured a cross-sectional design. We designed a retrospective cohort study to investigate the association between computer use and VFA using the FDT test.

Methods The study included 2377 workers (mean age 45.7 ± 8.3 years) who initially exhibited no VFA during FDT testing. Subjects then underwent annual follow-up FDT testing for 7 years, and VFA were determined by using a FDT-test protocol (FDT-VFA). Subjects with FDT-VFA were examined by ophthalmologists. Baseline data about the mean duration of computer years during a 5 year period and refractive errors were obtained via self-administered questionnaire.

Results A Cox proportional hazard analysis demonstrated that heavy VDT users (>8 h/day) had a significantly increased risk of FDT-VFA (hazard ratio (HR)=2.85, 95% confidence interval (CI): 1.26–6.48) relative to light users (<4 h/day), and this association was strengthened among subjects with refractive errors (HR=4.48, 95% CI: 1.87 to 10.74). The VDT usage history also significantly correlated with FDT-VFA among subject with refractive errors (p<0.05), and 73.1% of subjects with FDT-VFA and refractive errors were diagnosed as glaucomatous.

Conclusion The incidence of FDT-VFA appears to increase among Japanese workers who are heavy VDT users, particularly if they have refractive errors. These results are consistent with findings of our previous studies. Further investigations of epidemiology and causality are warranted, because causal relationship between VDT use and glaucoma is unknown.

Work Disability Prevention and Integration

1019 INJURY SEVERITY, RETURN TO WORK, AND DISABILITY IN OCCUPATIONAL INJURY- DOES COMMUNITY HEALTH PLAY A ROLE?

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10.1136/oemed-2018-ICOHabstracts.1530

Introduction Workers' compensation data provide a source of information on occupational injuries and their burden on workers and the workplace. Many factors may influence ultimate outcome of the claim and disability status, including those external from the workplace. Occupational injury outcomes may be influenced by the health of communities in which employees live. We explored an exciting injury surveillance and analysis technique by coupling geographical information systems (GIS), workers' compensation data, and community health assessment data to determine novel risk factors for occupational injury outcomes.

Methods Injured employee addresses from workers' compensation data were geocoded using Esri Street Map. Geographic masking maintained individual-level confidentiality. Community health assessment categories included: health opportunities, healthy living, chronic disease/conditions, infectious disease, and injury and violence. We calculated rates and comparative risk of severity and disability duration of workers' compensation claims based on community health assessment status. Using a negative binomial model, we estimated rate ratios (RR) and 95% confidence intervals (CI) as a function of claim rate. Cox proportional hazards regression assessed differences in duration of disability based on community health assessment status and estimated hazard ratios (HR) and 95% confidence intervals (CI).

Results Multiple categories of assessed community health indicators affected risk of severity, claim duration, and disability for occupational injury.

Discussion This innovative way of combining and visualising data may identify risk factors for occupational injury that may be spatially or community-based. The health of one's community may play a role in both personal and occupational health. A holistic, total worker view should be considered for prevention of disability in workers' compensation claims.

106 THE IMPACT OF THE NEW LEGISLATION ON RETURN TO WORK IN BELGIUM. EXPERIENCES OF A LARGE OCCUPATIONAL HEALTH SERVICE

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10.1136/oemed-2018-ICOHabstracts.1531

Introduction In order to prevent long-term sickness, Belgian authorities reformed legislation on return to work (RTW). From 2017, employees have access to the occupational health physicians (OHP) to support their RTW. In addition, employers, general practitioners and medical advisors can refer to OHP for disability assessment. In this study, we investigated for which diseases and conditions, RTW was most successful.

Methods RTW trajectories carried out by IDEWE, one of the largest Occupational Health Services, were analysed.

Differences according to gender, applicant, company size, duration and cause of absence were calculated and compared using Chi Square test.

Results 506 completed RTW trajectories were available for analysis: 33,2% for male employees, 66,8% for women. 59,3% was initiated by the employee and 31,6% by the employer. Most trajectories (29,2%) were initiated in large companies, but 23,9% was carried out in companies with less than 20 employees. Mental disorders (35,5%) and musculoskeletal problems (33,1%) represent 2/3 of the causes, which corresponds with the main causes of long-term sickness absence in Belgium.

For 28,3%, the occupational physician could realise return to work after making adjustments on the job. However, 60,5% could no longer be re-employed at the same workplace (no possible job-person fit anymore). Re-integration appeared more successful for musculoskeletal disorders (37,5%) than for mental problems (only 16,6%). Finally, the chance on effective return to work reduced with duration of sickness absence. No significant differences in outcome were observed according to gender.

Discussion Re-integration was realised with the guidance of the OHP for almost 30% of the trajectories. RTW is most challenging for mental disorders: guidance to re-employment into a more suitable job is indispensable to avoid long-term absence. In order to achieve this, cooperation with medical advisers can be explored.

1114 PREDICTING LOST PRODUCTIVE TIME AND MEDICAL COST DUE TO POOR PSYCHOSOCIAL WORKING CONDITIONS: A ONE-YEAR PROSPECTIVE STUDY

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10.1136/oemed-2018-ICOHabstracts.1532

Introduction It is still not clear how much future excess cost for employers and the society are related to the poor psychosocial working conditions. Such prediction may be useful to prioritise interventions to improve psychosocial working conditions in the workplace.

Methods A baseline survey was conducted of Japanese monitors registered to an Internet survey company who were employed (in December 2015 or February 2016). Out of 5150 respondents, 3875 full-time employees were surveyed about one year later (in December 2016). The questionnaire asked respondents their psychosocial working conditions: job strain (the ratio of job demands to job control), interpersonal conflict, supervisor and coworker support, measured by the Brief Job Stress Questionnaire; and effort-reward imbalance, measured by a 10-item ERI questionnaire. The questionnaire also measured lost productive time that was converted into lost labour cost; and total medical expenditure in the past month assessed by TiC-P (Bouwman, *et al.*, 2013). Multiple linear regression analysis was conducted of the one-year increase in the total monthly cost at follow-up on the five psychosocial working conditions, adjusting for sex, age, occupation, and the cost at baseline.