1632e WORK-RELATED UPPER EXTREMITY MUSCULOSKELETAL DISORDERS IN JAPAN

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In Japan, compensable occupational diseases are officially listed in Appended table 1 and 2 of Ordinance for Enforcement of the Labour Standards Act. The category No. 3 (diseases caused by work with extreme physical tension) includes a subcategory of (d): musculoskeletal disorders of the back of the head, neck, shoulder girdle, upper arm, forearm, or fingers due to work which require repeated input into a computer or other operation involving excessive tension on the upper limbs. Local labour standard bureau is in charge of judging the work-relatedness. The detailed criterion was first published as a notice from the Labour Standard Bureau, Ministry of Labour on Feb 5, 1975, as 'Judgment criterion for work-relatedness of upper extremity disorders from keypunching work' (Notification No. 59, 1975) and revised on Feb 3, 1997, as 'Judgment criterion for work-relatedness of diseases from upper extremity work' (Notification No. 65, 1997). Target diseases of the criterion include humeral epicondylitis, cubital tunnel syndrome, supinator syndrome, wrist tendonitis, carpal tunnel syndrome and cervico-omo-brachial syndrome (COBS; nonspecific symptoms of neck, shoulder and upper extremity). Three indispensable conditions of the required exposure for determining work-relatedness are:

- long ($\geq$6 months in general) and heavy workload to the upper extremity,
- excessive ($\geq$10% increase, $\geq$20% increase/day for 10 days/months or $\geq$20% increase/hour for $\geq$1/3 hours/day) workload for 3 months preceding symptoms and
- reasonable time course.

The criterion requires careful and comprehensive judgment of the work-relatedness of individual cases referring to the working environment, heteronomous and restrictive nature of the work, their age, physical strength, life style at home, etc. It recommends avoiding diagnosing as COBS; however, it still allows use of COBS when the specified diagnoses are difficult. According to the workers' compensation statistics in 2016, there were 153 cases of upper extremity diseases out of 7361 cases of occupational diseases in total with 4 or more lost work-days.

1632f VARIED CRITERIA FOR WORK-RELATED UPPER EXTREMITY DISORDERS IN UNITED STATES

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In the US, the acceptance of a claim for a work-related MSD is most commonly determined by the employer and insurance carrier with input from the physician's report. For most workers, the process is based on state laws, which vary from state to state. Some states (e.g., California) have adopted the ACOEM Medical Practice Guidelines (2nd Ed, 1). The Guidelines recommend a process for determining work-relatedness based on evidence of disease, evidence of exposure, epidemiology, and other factors (e.g., non-workplace exposures). For example, the diagnosis of carpal tunnel syndrome (CTS) should consider the presence of numbness/tingling in the median nerve distribution, electrodiagnostic studies (EDS), if available, and non-work factors such as age and BMI. Work-relatedness for CTS and other non-traumatic hand/wrist disorders (e.g., tendinosis, tendinitis, trigger digit) generally requires sustained or repeated forceful (>10N) pinching or gripping and the Guidelines refer to the ACGIH HAL TLV as a risk assessment tool. Other MSDs discussed include epcondylalgia (epicondylosis), ligament sprains, tenosynovitis/tendinosis (including 0de Quervain's), trigger digit, hand arm vibration syndrome (HAVS), ulnar and radial nerve entrapment, ganglion cyst and non-specific hand/wrist/forearm pain. Colorado State developed treatment guidelines for CTS (38-pages), with provisions that are enforceable under workers' compensation rules (2). The roles of history, physical examination and EDS in diagnosis and management are spelled out. For determining work-relatedness, job title alone is not sufficient. Six specific ergonomic hazards, with minimum daily exposure durations (e.g., pinching >18 n more than 3 hour per day) are listed. Washington State has a 13-page diagnosis and treatment guideline for CTS. Diagnosis requires both appropriate symptoms and an abnormal EDS. Work-related risk factors are listed but without the exposure thresholds provided in the Colorado guidelines. Thus, determinations of worker's compensation cases vary from state to state and these differences could influence comparative research studies.

1615 PHYSICAL ACTIVITY AND WORK

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Aim of special session To present recent data on work-related physical activity and sedentary behaviour and their effects on health and work-related outcomes

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1615a THE EFFECTIVENESS OF WORKPLACE TEAM SPORTS INTERVENTION ON EMPLOYEE WORK, HEALTH AND WELL-BEING

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Introduction Workplace Physical activity interventions can positively influence employee health and well-being outcomes. However, research to date is yet to comprehensively examine the efficacy of sport and team sport on health outcomes. Participation in workplace team sport has the capacity to improve not only individual health, but also social group and organisational health outcomes. This study evaluated the impact of a workplace team sport intervention. The primary outcome was aerobic fitness (estimated VO2 max). Secondary outcomes

included group cohesion, within-team communication and team job performance.

Methods Two regional worksites from one large company took part in either the team sport intervention (n=28) or the control group (n=20). The intervention consisted of weekly 1 hour team sport sessions for 12 weeks. Measures of aerobic fitness, physical activity, group cohesion, interaction and performance were measured pre- and post-intervention. Data were analysed using a series of mixed ANOVAs.

Results After 12 weeks, significant improvements were observed in the intervention group in VO2 max (+4.5 ±5.8 ml/min kg, p<0.002), interpersonal communication within teams (+3%, p<0.042) and mean weekly physical activity duration (+154.74′, p<0.002) in the intervention group.

Discussion Participation in team sport might be not only be an effective way to improve aerobic fitness and physical activity behaviour of employees, but may also improve interpersonal communication between colleagues, which may in turn impact organisational well-being. Further workplace team sports studies are required that assess other important indicators of health and social wellbeing.

1615b DO HIGH LEVELS OF OCCUPATIONAL SITTING TIME PREDICT SICKNESS ABSENCE, SICKNESS PRESENTEEISM AND LOW WORK ENGAGEMENT OVER TIME?

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Introduction Sedentary behaviour, has emerged as a risk factor for premature death and several chronic diseases. About one-third to half of our daily sitting time occurs at work. There is limited research on the link between occupational sitting and important work-related outcomes such as work engagement, presenteeism and sickness absence. An earlier cross-sectional study by Munir, *et al.* (2015) found that women had higher occupational sitting times than men and that men with high work engagement of vigour and dedication were less likely to have prolonged sitting time. In this study, we examine the effects of occupational sitting time on sickness absence, sickness presenteeism and work engagement, and over an 18 month period.

Methods A cohort of 1005 office workers from the Northern Ireland Civil Service (Stormont) completed a questionnaire in 2012 (T1) and in 2014 (T2). Occupational sitting time were divided into tertiles of low (<360 mins), medium (361–420 mins) and high levels of sitting time (421–600 mins). Logistic regressions and generalised linear regressions were used to analysed data.

Results Participants were predominantly female (n=613, 61%). There were no significant findings for occupational sitting times predicting sickness absence. Overall, males who reported moderate levels of sitting times at T1 were more likely to report engaging in sickness presenteeism at T2. This was not the case for those males reporting high levels of sitting time. Increase sitting time at T1 also contributed to lower levels of work engagement of dedication at T2 for males. There were no significant findings for females between occupational sitting times and work-related outcomes.

Discussion Our finding findings for levels of sitting time, sickness presenteeism and work engagement warrants further research.

1631 UPDATE ON ASSESSING RISK FOR UPPER LIMB MUSCULOSKELETAL DISORDERS

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The aim of this Special Session is to discuss recent changes to risk assessment tools for upper extremity MSDs.

This session will present recent findings from large prospective epidemiologic studies on carpal tunnel syndrome and other upper extremity disorders. Then other presenters will discuss how those findings have modified common risk assessment models such as the Strain Index, the ACGIH Hand Activity Level, and other methods.

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1631a UPDATE ON PHYSICAL FACTORS FROM THE ITALIAN OCTOPUS STUDY

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Introduction The American Conference of Governmental Industrial Hygienists (ACGIH) proposed a method to assess the hand, wrist and forearm biomechanical overload based on exertions frequency (hand-activity level) and force use (normalised peak force). We applied the ACGIH threshold limit value (TLV) method to a large occupational cohort to assess its ability to predict carpal tunnel syndrome (CTS) onset.

Methods A cohort of industrial and service workers was followed-up between 2000 and 2011. We investigated the incidence of CTS symptoms and CTS confirmed by nerve conduction studies (NCS). We then classified exposure with respect to action limit (AL) and TLV. Cox regression models including age, gender, body mass index, and presence of predisposing pathologies were conducted to estimate hazard ratios (HR) of CTS and population attributable fractions.

Results We analysed data from 3131 workers [females, n=2032 (65%); mean age at baseline 39.3, standard deviation (SD) 9.4 years]. We observed 431 incident cases of CTS symptoms in 8000 person-years and 126 cases of CTS confirmed by NCS in 8883 person-years. The ACGIH TLV method predicted both CTS symptoms [HR between AL and TLV 2.18, 95% confidence interval (95% CI) 1.86 to 2.56; above TLV 2.07, 95% CI: 1.52 to 2.81] and CTS confirmed by NCS (HR between AL and TLV 1.93, 95% CI: 1.38 to