

**Introduction** The world's population is ageing. This creates a need to work for longer, both for income and to provide an adequate labour force. For those employed in predominantly physically demanding jobs this means they are prolonging their exposure to risk factors known to increase the likelihood of a musculoskeletal injury when their work capacity may be declining. The work ability of older workers has been most frequently assessed using the Work Ability Index (WAI). Several studies have reported significant associations between low WAI scores and sickness absence and early retirement. Relatively fewer studies have examined associations between WAI scores and specific workplace risk factors. The purpose of this study was to investigate the association between a range of workplace risk factors and the WAI scores in a cohort of workers employed in physically demanding jobs.

**Methods** A cross-sectional survey of workers employed in physically demanding roles within a local government council was undertaken. The survey instruments included questions on demographic and employment characteristics, physical and psychosocial risk factors, pain and discomfort, and the Work Ability Index.

**Result** The survey was completed by 155/245 of eligible workers – a 63% response rate. Respondents had a mean age of 44 years. They were predominantly male (86%) with an average length of employment of 12 years. Bivariate regression analyses were undertaken to examine the relationship between WAI scores and age, pain/discomfort, levels of stress, irritation, job satisfaction, work-life balance, and 49 other work environment risk factors. Significant associations with WAI scores were seen for age, pain/discomfort and physical and psychosocial risk factors. The WAI score was reduced by more than 2.5 points for those who reported higher levels of exposure to a range of physical and psychosocial risk factors compared with those who reported lower levels of exposure.

**Discussion** It was found that the WAI provided a useful means to identify a range of workplace risk factors which, if addressed, could inform the development of interventions to maintain a healthy, older workforce. It is proposed that tailoring interventions using this approach should enhance their effectiveness.

## 1617 AGEING AND SHIFTWORK

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**Aim of this special session** Ageing and shiftwork is a rather new and 'hot topic' because of the intentions to prolong working lives in many countries. Because shiftwork could be very demanding for older employees it need more attention than earlier.

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## 1617a PERMANENT NIGHT WORK, AGE AND SICKNESS ABSENCE

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**Introduction** Night shift work is associated with adverse health effects. Yet, some persons prefer working permanent night shifts and it is speculated that they tolerate night work better than others. The aim of is to study associations between permanent night work, age and sickness absence. Due to self-selection out of night work over time by those who experience negative effects of night work, we hypothesised that older workers with permanent night work are 'healthy workers' with less sickness absence compared to other groups.

**Methods** Information on working hours, age (20–34 years, 35–49 years and >50 years) and sickness absence was obtained from the Danish Working Hour Database, which contains daily information on starting and ending time of working hours based on payroll data for all employees at Danish public hospitals (2008–2015). For each year with >50 workdays, individual schedules were classified as *permanent* day, evening or night (>88% of work days with night work), *2-shift* (day/evening, day/night or evening/day) or *3-shift* (day/evening/night). We applied linear regression with individual as random intercept (participants served as their own controls) for employees (n=5774) with at least one year of permanent night work.

**Results** Employees aged >50 years had 25.6 sickness days/year when working permanent night, which is more than in all other schedules. In comparison, employees had 9.0 (sd=1.0) fewer days when working permanent day, 7.3 (sd=2.4) for permanent evening, 6.3 (sd=0.9) for day/evening, 3.2 (sd=0.6) for day/night, 5.3 (sd=1.0) for evening/night, and 5.5 (sd=0.7) for day/evening/night. There was no interaction effect between schedule and age.

**Discussion** Employees had more sickness absence when working permanent night work compared to any other schedule. The association was not modified by age and did therefore not indicate that older employees with permanent night work tolerate night work better than others.

## 1617b PSYCHOSOCIAL AND HEALTH IMPLICATIONS OF AROUND THE CLOCK OPERATIONS FOR CORRECTIONS OFFICERS

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**Introduction** Corrections officers in state and federal prisons are faced with physical and psychosocial work demands that create challenges for maintaining high levels of workability, health and personal well-being. Furthermore, features of

correctional work design, including around-the-clock operations and routine pressure to participate in overtime work may have additional consequences for health and retention of an ageing correctional workforce. In this study, we examined the implications of shift work and extended work hours for officers' ability to maintain workability, health, and well-being in the face of stressful work demands, with attention focused on officer age (chronological age and psychological age) as a risk variable for increased negative outcomes.

**Methods** As part of a Total Worker Health intervention study, corrections officers at a state correctional system in the north-eastern USA participated in Wave 1 (n=335) or Wave 2 (n=260) of a survey that assessed physical and psychosocial work demands, work schedules, and several aspects of personal health and well-being. ANCOVA and moderated multiple regression analyses were used to examine the interactive effects of work schedule and age on relationships between work demands and worker health and well-being. An additional data collection in the same correctional system has recently been completed and will form the basis for follow-up analyses.

**Results** Initial findings indicate that corrections officers in this sample are at risk of several negative physical and mental health outcomes (e.g., obesity, depressive symptoms, burnout). Psychosocial features of corrections work, including work schedules, interacted with correctional officer age, with stronger negative consequences for several aspects of personal health and well-being among chronologically and psychologically older officers.

**Conclusion** In the face of an ageing corrections workforce, our findings suggest that particular attention should be paid to interventions that mitigate the impact of nightwork and overtime on the health and well-being of older officers.

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#### CIRCADIAN AND SLEEP HOMEOSTATIC INTERVENTION STRATEGIES FOR OLDER SHIFT WORKERS

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**Introduction** Night work is associated with shorter sleep and greater chronic disease risk compared with day work, and older shiftworkers report even greater difficulty sleeping compared with younger workers. We tested a sleep and circadian rhythm intervention to examine whether it improved sleep duration and cortisol, a marker of physiological stress.

**Methods** 26 healthy adults (57.6±3.9 y) who were not shiftworkers participated. Four laboratory Day shifts were followed by four Night shifts. Participants slept at home and maintained ~8 hour sleep schedules for a week before study and on Day shifts. After the first Night shift, participants were randomised into groups with different sleep instructions: control ad lib sleep (n=9); 8 hour evening sleep plus a light intervention (n=9); 8 hour evening sleep (n=5). The evening

sleep groups were instructed to get into bed between 1–2 pm and remain in bed attempting to sleep for 8 hour. Sleep was monitored by actigraphy. At the start of the 4th Day shift and end of the 4th Night shift, a blood sample was taken for cortisol assay.

**Results** The sleep duration and cortisol level of the groups were not different at baseline. The 8 hour evening sleep groups showed similar sleep durations following night and day shifts, while the control group had shorter sleep (p<0.001). At the end of the 4th Night shift, the 8 hour evening sleep groups had significantly lower cortisol levels compared with the control group (p<0.02).

**Discussion** Our preliminary data indicate an 8 hour scheduled evening sleep episode after night shifts results in longer sleep in older shiftworkers, and this was associated with lower cortisol levels. While this remains to be tested in actual night workers, it suggests that the sleep intervention may have implications for improved health outcomes in older shiftworkers.

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#### SHIFTWORK AND METABOLIC HEALTH RISKS – WHAT DOES THE LITERATURE CONCLUDE?

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**Introduction** Although the metabolic health effects of shift work have been extensively studied, a systematic synthesis of the available research is lacking. This review aimed to systematically summarise the available evidence of longitudinal studies linking shift work with metabolic risk factors.

**Methods** A systematic literature search was performed. Studies were included if (1) they had a longitudinal design; (2) shift work was studied as the exposure; and (3) the outcome involved a metabolic risk factor, including anthropometric, blood glucose, blood lipid, or blood pressure measures. Eligible studies were assessed for their methodologic quality. A best evidence synthesis consisting of three levels of evidence was used to draw conclusions per outcome: strong, moderate or insufficient evidence.

**Results** Thirty-nine articles describing 22 studies were included. Strong evidence was found for a relation between shift work and increased body weight/BMI, risk for overweight, and impaired glucose tolerance. For the remaining outcomes (waist circumference, blood lipids, and blood pressure), there was insufficient evidence.

**Discussion** Shift work seems to be associated with body weight gain, risk for overweight, and impaired glucose tolerance. Overall, lack of high-methodologic quality studies and inconsistency in findings led to insufficient evidence in assessing the relation between shift work and other metabolic risk factors. To strengthen the evidence, more high-quality longitudinal studies that provide more information on the shift work