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Thigh-worn Accelerometry for measuring Movement and Posture across the 24 hour cycle: A Scoping Review and Expert Statement

Appendix 2. Study Details

Table S2-1: Details of studies that use thigh-worn accelerometry to measure 24-hour Physical Behaviour

Study Details 1. Design 2. Years 3. Sampling method 4. Multi-centre? 5. N 6. Age* 7. Gender 8. Setting (community, occupational, clinical, other 9. Study Type (descriptive; health outcomes; correlates) 10. Mother study name	Accelerometry Protocol 1. Device 2. Placement/attachment 3. Other sensors 4. Protocol n Days / hour/day 5. Valid n of days for inclusion 6. Software 7. Processing Method	Accelerometry Variables	Health Outcome Variables	Covariates (confounders) / Mediators / Moderators	Sample Health Status (Descriptors variables)	PA/SB/Sleep Variables collected via Questionnaires	Data sharing
[26]							
1. Cross sectional 2. 2011-2012 3. Purposive sampling 4. Multi centre 5. N = 678 6. Ages: 57.8 7. Gender: F, M 8. Community 9. Health outcomes 10. The Australian Diabetes, Obesity, and Lifestyle study (AusDiab)	1. ActivPAL3 2. Right anterior thigh Water proofed, hypoallergenic patch 3. - 4. 7 consecutive days, 24/7 no removal 5. Minimum 4 days wear 6. ActivPAL Software 6.4.1; custom SAS v9.3 program 7. -	• Total sitting time • Prolonged sitting time • Sit-stand transitions • Usual bout duration	• Insulin • Cholesterol • Fasting plasma glucose • 2-hour post-load glucose • Triglycerides • Diabetes • BMI • Waist circumference • Lower back pain • High-density lipoprotein • Low-density lipoprotein • HbA1c • Systolic and diastolic blood pressure	• Age • Gender • Menopausal status • Contraceptive pill use • Blood pressure tablets • Cholesterol tablets • Diabetes medication • Ethnicity • Employment status • Annual household income • Fiber intake • Fat • Saturated fat • Alcohol intake • Sodium intake • Potassium intake • Fruit and vegetable serve		• Record sleep and any non-wear periods	
[27]							
1. Cross sectional 2. May 2012 and December 2013 3. Purposive sampling 4. -	1. MOX activity monitor 2. Thigh-mounted on anterior thigh 10 cm above the knee	• Total sedentary time • Prolonged sedentary time		• Sex • Age • Education level • Smoking status Presence of stoma	• Stage I to III colorectal cancer survivors diagnosed and treated between 2002 and 2010	• Short Questionnaire to Assess Health-enhancing physical activity	

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Study Details 1. Design 2. Years 3. Sampling method 4. Multi-centre? 5. N 6. Age* 7. Gender 8. Setting (community, occupational, clinical, other 9. Study Type (descriptive; health outcomes; correlates) 10. Mother study name	Accelerometry Protocol 1. Device 2. Placement/attachment 3. Other sensors 4. Protocol n Days / hour/day 5. Valid n of days for inclusion 6. Software 7. Processing Method	Accelerometry Variables	Health Outcome Variables	Covariates (confounders) / Mediators / Moderators	Sample Health Status (Descriptors variables)	PA/SB/Sleep Variables collected via Questionnaires	Data sharing
5. N: 145 6. Age: 70 7. Gender: F, M 8. Community 9. Descriptive 10. ColoRectal cancer (EnCoRe) study	waterproofed in a finger cot 3. - 4. 24 h/d during 7 consecutive day 5. ≥4 valid days 6. Customized Matlab program (Version R2012a 7. -	• Total physical activity time • Usual sedentary bout duration		• Diet • Cancer stage age at diagnosis • Treatment		• Record sleep and any non-wear periods	
[28]							
1. Cross sectional Seniors Understanding Sedentary Patterns (USP) study 2. - 3. Purposive sampling 4. Multi-centre 5. N: 700 6. Age: 65, 79, 83 7. Gender: F, M 8. Community 9. Correlates 11. The Lothian Birth Cohort, 1936 (LBC1936), and two cohorts of the West of Scotland Twenty-07 study (Twenty-07)	1. activPAL3c 2. the front of the thigh of their dominant leg using a waterproofing dressing 3. - 4. 7-days continuous recording 5. - 6. activPAL software 7. - 8.	• Average percentage of waking time spent sedentary • The number of sit to stand transitions		• Age at time of cognitive testing • Maximum educational attainment • Employment • Long-standing illness		• Record sleep periods	
[29]							
1. Cross sectional 2. September 2010 - October 2013 3. Convenience sampling 4. Southern part of the Netherlands 5. N:2,449 6. Age: 60	1. ActivPAL 2. The front of the right thigh Waterproofed using a nitrile sleeve. 3. - 4. Protocol: eight consecutive day	• Total time spent sedentary (sitting/lying), standing and stepping • Stepping intensity • Sedentary breaks	• Waist circumference • Triglycerides • High-density lipoprotein (HDL) cholesterol • Diastolic and systolic blood • Pressure	• Age • Sex • Educational level • BMI • Smoking • Alcohol use • T2DM • CVD	• Metabolic syndrome • Type 2 diabetes • History of CVD	• Mobility limitation was obtained from the EuroQol-5D questionnaire	

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Study Details 1. Design 2. Years 3. Sampling method 4. Multi-centre? 5. N 6. Age* 7. Gender 8. Setting (community, occupational, clinical, other 9. Study Type (descriptive; health outcomes; correlates) 10. Mother study name	Accelerometry Protocol 1. Device 2. Placement/attachment 3. Other sensors 4. Protocol n Days / hour/day 5. Valid n of days for inclusion 6. Software 7. Processing Method	Accelerometry Variables	Health Outcome Variables	Covariates (confounders) / Mediators / Moderators	Sample Health Status (Descriptors variables)	PA/SB/Sleep Variables collected via Questionnaires	Data sharing
7. Gender: F, M 8. Community 9. Health outcomes 12. The Maastricht Study	5. At least 1 valid day (≥10 h of waking data) 6. MATLAB® R2013b 9. -		• Fasting plasma glucose Medication use				
[30]							
1. Cross sectional 2. - 3. Purposive sampling 4. - 5. N: 271 6. Age: 79.1 7. Gender: F, M 8. Community 9. Correlates 13. Lothian Birth Cohort 1936	1. activPAL3c 2. the anterior thigh of the dominant leg with a waterproof dressing 3. - 4. Continuously for 7 days 5. 7 days 6. – 10. -	• The percentage of time spent sedentary • Number of sit-to-stand transitions • Number of steps		• Sex • Depressive symptoms • Chronic physical disease • BMI • Difficulties with activities of daily living • Education	•	•	
[31]							
1. Cross sectional 2. - 3. Purposive sampling 4. - 5. N: 248 6. Age: 79 7. Gender: F, M 8. Community 9. Health outcomes 14. Lothian Birth Cohort 1936	1. activPAL3c 2. the anterior thigh of the dominant leg with a waterproof dressing **3.** - 4. Continuously for 7seven days 5. 7 days 6. activPAL software (v7.2.32) 11. -	• The percentage of time spent sedentary • Number of sit-to-stand transitions • Number of steps	DNA methylation: epigenetic age acceleration	• Age, • Sex • Depressive symptoms • Chronic physical disease • BMI	•	• Record sleep periods	
[32]							
1. Cross sectional 2. - 3. Convenience sampling 4. Multi-centre 5. N:201 6. Age: 44.7 7. Gender: F, M 8. Occupational	1. Actigraph GT3X+ **2.** the medial front of the right thigh, midway between the hip and knee joints processus spinosus at the level of T1–T2 Water resistant **3.** -	• Total sitting time • Occupational sitting time • Leisure sitting time •	Low Back Pain intensity	• Age • Job seniority • BMI • Influence at work • Time spent carrying/lifting at work • Gender • Smoking	• A short questionnaire containing a single item regarding Low Back Pain intensity •	• A diary for noting working hours, leisure time, sleep, non-wear time, and time of reference measurement •	Available upon request

Study Details 1. Design 2. Years 3. Sampling method 4. Multi-centre? 5. N 6. Age* 7. Gender 8. Setting (community, occupational, clinical, other 9. Study Type (descriptive; health outcomes; correlates) 10. Mother study name	**Accelerometry Protocol** 1. Device 2. Placement/attachment 3. Other sensors 4. Protocol n Days / hour/day 5. Valid n of days for inclusion 6. Software 7. Processing Method	**Accelerometry Variables**	**Health Outcome Variables**	**Covariates (confounders) / Mediators / Moderators**	**Sample Health Status (Descriptors variables)**	**PA/SB/Sleep Variables collected via Questionnaires**	**Data sharing**
9. Health outcomes 15. New method for Objective Measurements of physical Activity in Daily living (NOMAD) Denmark	4. 4 continuous days (4 x 24 hours) 5. A at least two full working days 6. Actilife Software version 5.5; a specially developed MATLAB based program (Acti4) 12. -						
[33]							
1. Cross sectional 2. August 2011 and April 2012 3. Convenience sampling 4. Multi-centre 5. N:205 6. Age: 44.8 7. Gender: F, M 8. Occupational 9. Health outcomes New method for Objective Measurements of physical Activity in Daily living (NOMAD) Denmark	1. Actigraph GT3X+ 2. thigh and trunk Water resistant 3. - 4. 1-4 working days 5. At least one valid working day 6. Custom-made MATLAB program Acti4 software -	• Sitting time • Moderate vigorous physical activity • Bouts • Exposure Variation Analysis of sedentary time (EVA)	• Weight and fat percentage • Waist circumference BMI	• Age • Gender • Influence at work • Smoking behaviour • Poor dietary habits Alcohol intake		A diary for noting start and end of work, bedtime in the evening, and wake-up in the morning	Available upon request
[34]							
1. Cross sectional 2. - 3. Convenience sampling 4. Multi-centre 5. N:214 6. Age: 44.5 7. Gender: F, M 8. Occupational 9. Descriptive 16. New method for Objective Measurements of physical Activity in Daily living	1. Actigraph GT3X+ 2. - 3. - 4. 1-4 working days 5. At least one valid working day 6. Custom-made Acti4 software 7. - 13.	• Sedentary time (periods of sitting and lying) • Physical activity (collapsed periods with any type of PA) •		• Age • Gender • BMI • Job type Occupational sedentary time • Occupational physical activity	•	• A diary for noting working hours	Available upon request

Study Details 1. Design 2. Years 3. Sampling method 4. Multi-centre? 5. N 6. Age* 7. Gender 8. Setting (community, occupational, clinical, other) 9. Study Type (descriptive; health outcomes; correlates) 10. Mother study name (NOMAD) Denmark	**Accelerometry Protocol** 1. Device 2. Placement/attachment 3. Other sensors 4. Protocol n Days / hour/day 5. Valid n of days for inclusion 6. Software 7. Processing Method	**Accelerometry Variables**	**Health Outcome Variables**	**Covariates (confounders) / Mediators / Moderators**	**Sample Health Status (Descriptors variables)**	**PA/SB/Sleep Variables collected via Questionnaires**	**Data sharing**
[35]							
1. Cross sectional 2. October 2011 to April 2012 3. Convenience sampling 4. Multi-centre 5. N:147 6. Age: 44.4 7. Gender: F, M 8. Occupational 9. Health outcomes 17. New method for Objective Measurements of physical Activity in Daily living (NOMAD) Denmark	1. Actigraph GT3X+ 2. the right thigh; water resistant 3. - 4. 4 consecutive days 5. At least one valid day 6. MATLAB software Acti4 7. - 14.	• Light physical activity: the average time spent standing still, moving and slow walking • The average time spent fast walking, running, stair climbing and cycling •	Low back pain	• Age • BMI • LBP intensity	•	• A diary for noting working hours, non-work time, sleep periods, and time of reference measurement • A retrospective questionnaire • regarding the average time spent lying, sitting, standing, • slow and fast walking, running, and cycling per day during the measurement period	Available upon request
[36]							
1. Cross sectional 2. Spring 2012- Spring 2014 3. Convenience sampling 4. Multi-centre 5. N:692 6. Age: 45.1 7. Gender: F, M 8. Occupational 9. Health outcomes 10. Danish PHysical ACTivity cohort with Objective measurements (DPhacto) Denmark	1. Actigraph GT3X+ 2. Right thigh 3. - 4. 4 consecutive days including at least 2 working days 5. At least one valid day 6. Custom-made MATLAB program (Acti4 software) 7. -	• Total sedentary time (total time spent sitting or lying) • Total time spent standing still, moving • Total time spent stair-climbing, running, cycling • MVPA time • Total walk time • Exposure Variation Analysis of sedentary time	• Weight • Body fat percentage • Waist circumference	• Sex • Age • Smoking behaviour • Alcohol intake • Poor dietary habits • Influence at work		• A diary for noting working • hours, non-work time, time in bed, non-wear • time, and time of reference measurement	• Danish Data Protection Agency • accepted the handling and storage of data
[37]							
1. Prospective	1. Actigraph GT3X+	• The total time spent walking, climbing	• Neck shoulder pain	• Age • Sex		• A diary for noting working hours,	• Danish Data Protection Agency

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Study Details 1. Design 2. Years 3. Sampling method 4. Multi-centre? 5. N 6. Age* 7. Gender 8. Setting (community, occupational, clinical, other 9. Study Type (descriptive; health outcomes; correlates) 10. Mother study name	Accelerometry Protocol 1. Device 2. Placement/attachment 3. Other sensors 4. Protocol n Days / hour/day 5. Valid n of days for inclusion 6. Software 7. Processing Method	Accelerometry Variables	Health Outcome Variables	Covariates (confounders) / Mediators / Moderators	Sample Health Status (Descriptors variables)	PA/SB/Sleep Variables collected via Questionnaires	Data sharing
2. Spring 2012- Spring 2013 3. Convenience sampling 4. Multi-centre 5. N:625 6. Age: 44.8 7. Gender: F, M 8. Occupational 9. Health outcomes 10. Danish PHysical ACTivity cohort with Objective measurements (DPhacto) Denmark	2. Thigh, dominant upper arm, hip, and trunk 3. - 4. Four to five days, including at least two working days 5. At least 1 day 6. Actilife software version 5.5 a custom-made MATLAB-based software, Acti4 7. -	stairs, running and cycling		• Seniority in the • current job • Lifting and carrying time at work • Influence and social support at work • The number of days • with NSP during the previous 12 months • BMI		leisure time, sleep periods, and time of reference measurement	• accepted the handling and storage of data
[38]							
1. Cross sectional 2. April 2012- May 2014 3. Convenience sampling 4. Multi-centre 5. N:514 6. Age: 45.3 7. Gender: F, M 8. Occupational 9. Health outcomes 10. Danish PHysical ACTivity cohort with Objective measurements (DPhacto) Denmark	1. Actigraph GT3X+ 2. Thigh, dominant upper arm, hip, and trunk Water resistant 3. The Actiheart monitor – water resistant 4. Four to five days, including at least two working days 5. At least 1 day 6. Actilife software version 5.5 7. -	• Total time spent walking, climbing stairs, running, cycling	• Resting systolic and diastolic blood pressure • Heart rate variability	• Age • Gender • Smoking • Social support at work • Seniority in the current job • Current use of cardiovascular drugs • BMI • Resting systolic and diastolic blood pressure		• Written diary to note working hours, leisure • time and sleep, as well as the time of the reference • measurements	• Danish Data Protection Agency • accepted the handling and storage of data
[39]							
1. Cross sectional 2. October 2011 to April 2012 3. Convenience sampling 4. Multi-centre 5. N:191	1. Actigraph GT3X+ 2. Thigh and trunk water-resistant 3. - 4. Four consecutive days for at least two working days	• Total time spent sitting, standing, walking • Exposure Variation Analysis of physical activity		• Age • Gender		• A diary for noting working hours, non-wear time, and sleep periods	• Available upon request

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Study Details 1. Design 2. Years 3. Sampling method 4. Multi-centre? 5. N 6. Age* 7. Gender 8. Setting (community, occupational, clinical, other 9. Study Type (descriptive; health outcomes; correlates) 10. Mother study name	Accelerometry Protocol 1. Device 2. Placement/attachment 3. Other sensors 4. Protocol n Days / hour/day 5. Valid n of days for inclusion 6. Software 7. Processing Method	Accelerometry Variables	Health Outcome Variables	Covariates (confounders) / Mediators / Moderators	Sample Health Status (Descriptors variables)	PA/SB/Sleep Variables collected via Questionnaires	Data sharing
6. Age: 45 7. Gender: F, M 8. Occupational 9. Descriptive 10. New method for Objective Measurements of physical Activity in Daily living (NOMAD) Denmark	5. Days only included if they contained objective measurements for at least 4 h of work 6. Actilife software version 5.5; a custom-made MATLAB-based software, Acti4 7. -						
[40]							
1. Cross sectional 2. Spring 2012- Spring 2013 3. Convenience sampling 4. Multi-centre 5. N:659 6. Age: 45 7. Gender: F, M 8. Occupational 9. Health outcomes 10. Danish PHysical ACTivity cohort with Objective measurements (DPhacto) Denmark	1. Actigraph GT3X+ 2. Thigh, dominant upper arm, hip, and trunk 3. - 4. Four consecutive days, including at least two working days 5. At least 1 day 6. Actilife software version 5.5; a custom-made MATLAB-based software, Acti4 7. -	• Sitting periods • EVA • The total time spent walking, climbing stairs, running and cycling	• Neck shoulder pain	• Age • Smoking • BMI • Seniority in the current • Job • Lifting and carrying at work • Influence at work • Social support	• Self-reported neck–shoulder pain	• A diary for noting working time, leisure time, sleep periods, and time of reference measurement	• Danish Data Protection Agency accepted the handling and storage of data
[41]							
1. Cross sectional 2. October 2011 to April 2012 3. Convenience sampling 4. Multi-centre 5. N:138 6. Age: 45.5 7. Gender: F, M 8. Occupational 9. Health outcomes 10. New method for Objective	1. Actigraph GT3X+ 2. Thigh and trunk water-resistant 3. Actiheart monitor 4. Four consecutive days 5. At least 1 day 6. Actilife software version 5.5; a custom-made MATLAB-based software, Acti4 7. -	• Sitting time • Total time spent walking fast-pace, running, cycling, and walking stairs	• Heart Rate Variability during night-time sleep	• Age • Gender • Smoking • BMI • Seniority in the current job • Influence at work • Lifting and carrying time at work • Working night shifts • Regular use of prescribed heart	• Self-reported data on medical diagnoses • The life-time occurrence of diagnosed diabetes, cardiovascular disease, hypertension, and depression	• A diary for noting working hours, non-wear time, sleep periods	• Available upon request

Study Details 1. Design 2. Years 3. Sampling method 4. Multi-centre? 5. N 6. Age* 7. Gender 8. Setting (community, occupational, clinical, other 9. Study Type (descriptive; health outcomes; correlates) 10. Mother study name	Accelerometry Protocol 1. Device 2. Placement/attachment 3. Other sensors 4. Protocol n Days / hour/day 5. Valid n of days for inclusion 6. Software 7. Processing Method	Accelerometry Variables	Health Outcome Variables	Covariates (confounders) / Mediators / Moderators	Sample Health Status (Descriptors variables)	PA/SB/Sleep Variables collected via Questionnaires	Data sharing
Measurements of physical Activity in Daily living (NOMAD) Denmark				and/or lung medicine			
[42]							
1. Cross sectional 2. 2011 to 2013 3. Convenience sampling 4. Multi-centre 5. N:812 6. Age: 45 7. Gender: F, M 8. Occupational 9. Descriptive 10. New method for Objective Measurements of physical Activity in Daily living (NOMAD) Denmark and the Danish Physical ACTivity cohort with Objective measurements (DPhacto)	1. Actigraph GT3X+ 2. Halfway between crista iliac and patella at the medial front of the right thigh 3. - 4. Four successive days 5. - 6. Actilife software version 5.5 a custom-made MATLAB-based software, Acti4 7. -	• Sedentary behaviour (lying/sitting) • Light (stand/slow walking) • Moderate-to-vigorous (fast walking/running/cycling).		• Occupational sector • Job seniority • Smoking • Frequency of fruit and vegetable intake • BMI		• A diary for noting working hours, non-wear time, sleep periods, and time of reference measurement	
[43]							
1. Cross sectional 2. - 3. Convenience sampling 4. Multi centre 5. N:317 6. Age: 45 7. Gender: F, M 8. Occupational 9. Health outcomes 10. Take a Stand!	1. ActiGraph GT3x+ 2. Right thigh Waterproofed 3. - 4. 5 continuous working days 5. Only working hours 6. MatLab software (Acti4) 7. -	• Number of sit-to-stand transitions • Total sitting time • Number of prolonged sitting • Total time accumulated in prolonged sitting periods	• Waist circumference • Weight • BMI	• Age • Sex • Smoking • Self-rated health		• A log for noting sleep periods and any irregularities such as problems with the ActiGraph, days off work or working at home	
[44]							

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1. Cross sectional 2. December 2012-March 2013 3. Convenience sampling 4. Multi-centre 5. N:704 6. Age: 45 7. Gender: F, M 8. Occupational 9. Health outcomes 10. Danish PHysical ACTivity cohort with Objective measurements (DPhacto) Denmark	1. ActiGraph GT3x+ 2. The skin at the front of the right thigh (medial between the iliac crest and the upper border of the patella) and at the trunk (at processus spinosus at the level of T1-T2) 3. - 4. For 4–6 days, 24 hours a day 5. Working hours were included if they were ≥4 hours/day (continuous periods) or a duration of ≥75% of average wear time during work across days 6. Actilife software version 5.5; the customized software Acti4 7. -	• Sitting periods • Sitting during the whole day • Sitting during work • Plus EVA variables	• Low back pain	• Age • Sex • Smoking • BMI • Level of occupational lifting • Occupational • Sector • Previously diagnosed with a herniated • Disc • Leisure-time physical activity • Intensity of physical activity during working hours • Social support Influence at work • Age • Sex • BMI • Occupational • Sector • Level of physical activity during leisure • time • Intensity of physical activity during working hours.		• A diary for noting working hours, time off work, non-wear time and sleep periods	• Danish Data Protection Agency • accepted the handling and storage of data
[45]							
1. Cross sectional 2. - 3. Convenience sampling 4. Multi-centre 5. N:479 6. Age: (median: 47 for no LBP, 46 for LBP)	1. ActiGraph GT3x+ 2. medial front of the right thigh, halfway between knee and hip 3. - 4. 7 consecutive days 5. Only participants with ≥40 hours of	• Time spent sedentary, standing, walking, running, stairclimbing, and cycling during leisure time and at work		• Age • Gender • Marital status • Educational level Smoking • Chronotype • Occupation		• A diary for noting working hours, non-wear time, and sleep periods	

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Study Details 1. Design 2. Years 3. Sampling method 4. Multi-centre? 5. N 6. Age* 7. Gender 8. Setting (community, occupational, clinical, other) 9. Study Type (descriptive; health outcomes; correlates) 10. Mother study name	Accelerometry Protocol 1. Device 2. Placement/attachment 3. Other sensors 4. Protocol n Days / hour/day 5. Valid n of days for inclusion 6. Software 7. Processing Method	Accelerometry Variables	Health Outcome Variables	Covariates (confounders) / Mediators / Moderators	Sample Health Status (Descriptors variables)	PA/SB/Sleep Variables collected via Questionnaires	Data sharing
7. Gender: F, M 8. Occupational 9. Descriptive 10. Klokwerk+	wear-time including ≥4 working hours and ≥10 hours of leisure time were included 6. Actilife software version 5.5; a custom-made MatLab-based software Acti4 7. -						
[46]							
1. Cross sectional 2. November 2010 - September 2013 3. Convenience sampling 4. Southern part of the Netherlands 5. N:2,258 6. Age: 60.1 7. Gender: F, M 8. Community 9. Health outcomes 10. The Maastricht Study	1. ActivPAL3 2. The front of the right thigh Waterproofed 3. - 4. 8 consecutive days 5. At least 1 valid day (≥10 h of waking data) 6. - 7. -	• Stepping time • Waking time • The total amount of sedentary time • Number of sedentary breaks • Number of prolonged sedentary bouts • Average sedentary bout duration	• Kidney function • Waist circumference Total cholesterol, HDL-cholesterol • Triglycerides • Blood pressure, • 24h average ambulatory blood pressure • Glucose metabolism status	• Sex • Age • Smoking behavior Alcohol consumption Daily energy intake, Mobility limitation • Noncardiovascular comorbidity • History of CVD • Level of education • Use of • antihypertensive and lipid-modifying medication			
[47]							
1. Cross sectional 2. - 3. Purposive sampling 4. Multi centre 5. N:458 patient/loved one dyads 6. Age: patient -67, loved ones-66 7. Gender: F, M 8. Community 9. Health outcomes	1. MOX Activity Monitor 2. The right thigh 3. - 4. At least 7 days 5. At least 5 days of assessment (three weekdays, Saturday, Sunday), each with at least 10 h of measurement. 6. –	• Time in sedentary behavior • Time in light activities • Time in moderate to vigorous physical activity	• Clinical data • Body composition • Postbronchodilator lung function • Functional mobility • Generic and COPD-specific health status	• Age Sex • Relationship between patient and loved one • Working situation • Smoking status • Time living together • Receiving informal care from • relatives • Rollator use	• Global Initiative for Chronic Obstructive Lung Disease (GOLD) COPD diagnosis with a • moderate to very severe degree of airflow limitation (GOLD grades 2-4)	• Exercise motivation (Behavioral Regulation and Exercise Questionnaire 2 (BREQ-2)	

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10. Home Sweet Home study	7. -			• Cane use • Long-term oxygen therapy • Exacerbations past 12 mo • Medications in use • BMI			
[48]							
1. Cross sectional 2. October 2011 – April 2012 3. Convenience sampling 4. Multi-centre 5. N:187 6. Age: 45 7. Gender: F, M 8. Occupational 9. Health outcomes 10. New method for Objective Measurements of physical Activity in Daily living (NOMAD) Denmark	1. Actigraph GT3X+ 2. Thigh and hip Water resistant 3. - 4. 4 consecutive days for at least two working days 5. Days with at least 4 h of work 6. Actilife software version 5.5; a custom-made MATLAB-based software, Acti4 7. -	• Duration of standing still and walking at work • Forward bending	• Low back pain intensity	• Gender • Age, • Seniority • BMI • Smoking • Time on feet during leisure hours • Forward bending • Carrying/lifting • Influence at work	• Self-reported • LBP intensity	• A diary for noting working hours, leisure time, non-wear time, sleep periods and time of reference measurement	• Available upon request
[49]							
1. Cross sectional 2. November 2010 - September 2013 3. Convenience sampling 4. Southern part of the Netherlands 5. N:2,045 6. Age: 60.2 7. Gender: F, M 8. Community 9. Descriptive 10. The Maastricht Study	1. ActivPAL3 2. The front of the right thigh Waterproofed 3. - 4. 8 consecutive days 5. At least 1 valid weekday and 1 valid weekend day (≥10 h of waking data) 6. activPAL software MATLAB R2013b 7. -	• The total sedentary time • The total amount of stepping • The total standing time		• Employment status • Age • Sex • Diabetes Status • Mobility limitations • Level of education • Smoking • Alcohol consumption • BMI • Frequency of shift work			

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Study Details 1. Design 2. Years 3. Sampling method 4. Multi-centre? 5. N 6. Age* 7. Gender 8. Setting (community, occupational, clinical, other 9. Study Type (descriptive; health outcomes; correlates) 10. Mother study name	Accelerometry Protocol 1. Device 2. Placement/attachment 3. Other sensors 4. Protocol n Days / hour/day 5. Valid n of days for inclusion 6. Software 7. Processing Method	Accelerometry Variables	Health Outcome Variables	Covariates (confounders) / Mediators / Moderators	Sample Health Status (Descriptors variables)	PA/SB/Sleep Variables collected via Questionnaires	Data sharing
[50]							
1. Cross sectional 2. 2011 to 2013 3. Convenience sampling 4. Multi-centre 5. N:895 6. Age: 46.6 men, 46.5 women 7. Gender: F, M 8. Occupational 9. Health outcomes 10. New method for Objective Measurements of physical Activity in Daily living (NOMAD) Denmark and the Danish Physical ACTivity cohort with Objective measurements (DPhacto)	1. Actigraph GT3X+ 2. upper back and right thigh 3. - 4. Four consecutive days 5. At least one day of valid accelerometer measurements 6. Actilife software version 5.5 a custom-made MATLAB-based software, Acti4 7. -	• Time spent walking, standing, sitting • High intensity activities (HiPA: stair climbing, running and cycling). • Sedentary behavior (sitting and lying), • Time in bed	• Pain in lower back, knees and feet/ankles	• Sex • Age • BMI • Shift work • Information about pain in lower back, knees and feet/ankles • Information on whether the worker was skilled		• A diary for noting working hours, non-wear time and sleep periods	
[51]							
1. Cross sectional 2. March 2013 to March 2014 3. Convenience sampling 4. Multi-centre 5. N:433 6. Age: 39.6 7. Gender: F, M 8. Occupational 9. Correlates 10. Active Buildings study	1. ActivPAL3 2. Middle front of the right thigh waterproof 3. - 4. Five consecutive days (encompassing ≥3 workdays) 5. Days when the ActivPALTM3 was not worn continuously were Removed 6. ActivPALTM3 software Microsoft Excel 2010 7. -	• Sitting time • Standing time • Sit-to-stand transitions • Step counts		• Age • Sex • Smoking • Occupation and organization • BMI • Participants' environmental perceptions		• A diary for noting working hours and non-wear time	

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Study Details 1. Design 2. Years 3. Sampling method 4. Multi-centre? 5. N 6. Age* 7. Gender 8. Setting (community, occupational, clinical, other 9. Study Type (descriptive; health outcomes; correlates) 10. Mother study name	Accelerometry Protocol 1. Device 2. Placement/attachment 3. Other sensors 4. Protocol n Days / hour/day 5. Valid n of days for inclusion 6. Software 7. Processing Method	Accelerometry Variables	Health Outcome Variables	Covariates (confounders) / Mediators / Moderators	Sample Health Status (Descriptors variables)	PA/SB/Sleep Variables collected via Questionnaires	Data sharing
[52]							
1. Cross sectional 2. November 2014-April 2016 3. Purposive sampling 4. Multi-centre 5. N: 700 6. Age: 64, 79, 83 7. Gender: F, M 8. Community 9. Correlates 10. The Lothian Birth Cohort, 1936 (LBC1936), and the West of Scotland Twenty-07 study (Twenty-07)	1. activPAL3c 2. the front of the thigh of their dominant leg using a waterproofing dressing 3. Other sensors 4. 7-days continuous recording 5. - 6. - 7. -	• Percentage of waking time • Sedentary behaviour		• Objective neighbourhood • Subjective neighbourhood • Social support • Social participation, Home environment measures		• Record sleep periods	
[53]							
1. Cross sectional 2. November 2014-April 2016 3. Purposive sampling 4. Multi-centre 5. N: 700 6. Age: 64, 79, 83 7. Gender: F, M 8. Community 9. Correlates 10. The Lothian Birth Cohort, 1936 (LBC1936), and the West of Scotland Twenty-07 study (Twenty-07)	1. activPAL3c 2. the front of the thigh of their dominant leg using a waterproofing dressing 3. Other sensors 4. 7-days continuous recording 5. - 6. - 7. -	• Sedentary behaviour • Time spent walking		• Education • Occupation • Income • Car ownership Subjective social position • Parental social • class • Lifetime social class		• Record sleep periods	
[54]							
1. Cross sectional 2. Spring 2012- Spring 2014 3. Convenience sampling 4. Multi-centre	1. ActiGraph GT3x+ 2. on the thigh and the upper back; waterproof 3. upper back	• Total time spent walking, running, cycling and walking stairs	• Insomnia symptoms	• Age • BMI • Smoking • Alcohol consumption • Medication		• A diary for noting working days, working hours, days off work and non-wear time	• Danish Data Protection Agency • accepted the handling and storage of data

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5. N:650 6. Age: 49 7. Gender: F, M 8. Occupational 9. Health outcomes 10. Danish PHysical ACTivity cohort with Objective measurements (DPhacto) Denmark	4. Protocol n Days / hour/day: six consecutive days, including at least two working and two leisure days 5. Valid n of days for inclusion: non-wear periods excluded 6. Actilife software version 5.5; Acti4 7. -			• for depression • participant's workplace • Intensity and extent of musculoskeletal • Pain • Shift work • Number of working hours per week			
[55]							
1. Cross sectional 2. 2013 to 2014 3. Convenience sampling 4. Multi-centre 5. N:164 6. Age: 39 7. Gender: F, M 8. Occupational 9. Descriptive 10. Active Buildings study	1. ActivPAL3 2. middle front of the right thigh; waterproof 3. - 4. 24 hours a day for five consecutive days (encompassing ≥3 workdays) 5. Days when three or more weekdays and at least one weekend day 6. ActivPALTM3 software Microsoft Excel 2010 7. -	• Time spent sitting, standing, stepping • Step counts • Frequency of sit/stand transitions		• Age • Sex • Ethnicity • Job role		• A diary for noting sleep periods and any irregularities such as problems with the ActiGraph, days off work or working at home	
[56]							
1. Cross sectional 2. March 2013 to March 2014 3. Convenience sampling 4. Multi-centre 5. N:116 6. Age: 40 7. Gender: F, M 8. Occupational 9. Descriptive	1. ActivPAL3 2. middle front of the right thigh; waterproof 3. - 4. 24 hours a day for five consecutive days (encompassing ≥3 workdays) 5. Minimum of 3 workdays	• Occupational step counts, stepping time, sitting time, standing time and sit-to-stand transitions		• Age • Sex • Ethnicity • Job role • Habit strength • Organisation • BMI • Scio-cultural workplace environment		• The Movement at Work survey • A diary for noting working days, time of arrival and departure from the office and non-wear time	

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10. Active Buildings study	6. - 7. -						
[57]							
1. Cross sectional 2. November 2010 - September 2013 3. Convenience sampling 4. Southern part of the Netherlands 5. N:2,497 6. Age: 60 7. Gender: F, M 8. Community 9. Health outcomes 10. The Maastricht Study	1. ActivPAL3 2. The front of the right thigh; waterproofed 3. Other sensors 4. 24 h/day for 8 consecutive days 5. At least 1 valid day (>14 h of waking data). 6. activPAL software MATLAB R2013b 7. -	• Sedentary time • Number of sedentary breaks • Prolonged sedentary bouts • Average duration of the sedentary bouts	• Oral glucose tolerance test • Metabolic syndrome • Waist circumference, Triacylglycerol levels • HDL-cholesterol levels • Fasting glucose levels • Blood pressure • Medication use	• Sex • Age • Level of education • Smoking status • Alcohol consumption Mobility limitation Health status • Diabetes duration • Medication use • BMI • HbA1c • Higher intensity • physical activity		• Record sleep periods	
[58]							
1. Cross sectional 2. November 2010 - September 2013 3. Convenience sampling 4. Southern part of the Netherlands 5. N:2,213 6. Age: 60 7. Gender: F, M 8. Community 9. Health outcomes 10. The Maastricht Study	1. ActivPAL3 2. The front of the right thigh Waterproofed 3. - 4. 8 consecutive days 5. At least 1 valid day (≥10 h of waking data) 6. - 7. -	• Sedentary time (sitting or lying) • The total amount of standing time • The total amount of stepping time	• Waist circumference • BMI • Blood pressure • HDL cholesterol • Total-to-HDL cholesterol ratio • Triacylglycerol • Fasting glucose • 2 h postload glucose, • HbA1c • Fasting insulin • Metabolic syndrome • Type 2 diabetes	• Sex • Age • Level of education Smoking status • Alcohol consumption Energy intake Mobility limitation • Prevalent cardiovascular disease • Use of lipid-modifying, antihypertensive • Glucose-lowering medication • Depression • Glucose metabolism • status			
[59]							

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1. Cross sectional 2. November 2010 - September 2013 3. Convenience sampling 4. Southern part of the Netherlands 5. N:2,024 6. Age: 59.7 7. Gender: F, M 8. Community 9. Health outcomes 10. The Maastricht Study	1. ActivPAL3 2. The front of the right thigh; waterproofed 3. - 4. 8 consecutive days 5. At least 1 valid day (≥10 h of waking data) 6. activPAL software customized MATLAB R2013b 7. -	• Sedentary time (sitting or lying) • The number of sedentary breaks • Prolonged sedentary bouts • Average bout duration • The total amount of standing • The total amount of stepping • Stepping time	• Submaximal cycle ergometer test: CRF	• BMI • Age • Education level Alcohol use • Smoking status • CVD • Energy intake • Mobility limitations • Beta-blocker use T2DM			
[60]							
1. Cross sectional 2. May and August 2014 3. Convenience sampling 4. One centre 5. N:159 6. Age: 50 7. Gender: M 8. Occupational 9. Health outcomes 10. -	1. ActivPAL3 2. The front of the right thigh; waterproofed 3. - 4. 24 h/day over 7 days 5. At least four full days 6. activPAL software; custom Microsoft Excel macro 7. -	• Sitting, standing and stepping time • Average number of transitions from sitting to standing • Number of steps • Average cadence of steps	• Blood pressure • Heart rate • Waist circumference • Hip circumference • Body composition • Fasted capillary blood glucose • Triglycerides • High density lipoprotein cholesterol, • Low-density lipoprotein cholesterol • Total cholesterol	• Age • Ethnicity • Average weekly working hours • Medical problems Medication • Intake of fruit and vegetables, • Alcohol intake • Smoking status • Anxiety and depression • BMI		• A diary for noting sleep periods and non-wear time	
[61]							
1. Cross sectional 2. December 2011 - March 2013 3. Convenience sampling 4. Multi-centre 5. N:457 6. Age: 46	1. ActiGraph GT3x+ 2. processus spinosus at the level of T1-T2 and at the halfway mark on the vertical line between spina illiaca anterior	• The duration of forward bending	• Trunk and low back • pain intensity	• Age • Gender • Smoking habits • BMI • Social • Seniority • Lift burden at work		• A diary for noting working hours, leisure hours, sleep, non-wear time and specific time for the reference measurements	• The Danish Data Protection Agency has • accepted the handling and storage of data

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7. Gender: F, M 8. Occupational 9. Health outcomes 10. Danish PHysical ACTivity cohort with Objective measurements (DPhacto) Denmark	superior and the patella 3. - 4. For several consecutive days during work 5. ≥4 hours of recordings of working time or ≥75% of average self-reported working time, and ≥4 hours measured during leisure time or ≥75% of average self-reported leisure time per day if the worker had ≥2 days of recordings. 6. MATLAB based Acti4 7. -			• Forward bending of the trunk during work • Social support at work			
[62]							
1. Cross sectional 2. December 2011 - March 2013 3. Convenience sampling 4. Multi-centre 5. N:657 6. Age: 45 7. Gender: F, M 8. Occupational 9. Descriptive 10. Danish PHysical ACTivity cohort with Objective measurements (DPhacto) Denmark	1. ActiGraph GT3x+ 2. At processus spinosus at the level of T1-T2 and at the halfway mark on the vertical line between spina illiaca anterior superior and the patella 3. - 4. - 5. ≥4 hours of recordings of working time or ≥75% of average self-reported working time, and ≥4 hours measured during leisure time	• The duration of forward bending of the trunk • EVA		• Age • Gender • BMI • Smoking habits • Low back pain intensity		• A diary for noting information about specific time episodes during the measurement • period	• Danish Data Protection Agency • accepted the handling and storage of data

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	or ≥75% of average selfreported leisure time per day if the worker had ≥2 days of recordings. 6. Acti4 7. -						
[63]							
1. Cross sectional 2. October 2011 to April 2012 3. Convenience sampling 4. Multi-centre 5. N:198 6. Age: 44.7 7. Gender: F, M 8. Occupational 9. Health outcomes 10. New method for Objective Measurements of physical Activity in Daily living (NOMAD) Denmark	1. Actigraph GT3X+ 2. At processus spinosus at the level of T1–T2 and at the halfway mark on the vertical line between spina illiaca anterior superior and the patella 3. - 4. - 5. ≥4 working hours and ≥10 of total recordings per day 6. Actilife software version 5.5; a custom-made MATLAB-based software (Acti4) 7. -	• The duration of forward bending of the trunk	• LBP intensity	• Age • Gender • Smoking habits • BMI • Work-related psychosocial risk factors • the duration categories of forward • bending of the trunk during work		• A diary for noting working hours, leisure hours, sleep, non-wear time and specific time for the reference • measurements	• Available upon request
11.	8.	•	•	•		•	•
12.	9.	•	•	•		•	•
13.	10.	•	•	•		•	•
14.	11.	•	•	•		•	•
15.	12.	•	•	•		•	•
16.	13.	•	•	•		•	•
17.	14.	•	•	•		•	•
18.	15.	•	•	•		•	•
19.	16.	•	•	•		•	•
20.	17.	•	•	•		•	•
21.	18.	•	•	•		•	•

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22.	19.	•	•	•		•	•
23.	20.	•	•	•		•	•
24.	21.	•	•	•		•	•
25.	22.	•	•	•		•	•
26.	23.	•	•	•		•	•
27.	24.	•	•	•		•	•
28.	25.	•	•	•		•	•
29.	26.	•	•	•		•	•
30.	27.	•	•	•		•	•
31.	28.	•	•	•		•	•
32.	29.	•	•	•		•	•
33.	30.	•	•	•		•	•
34.	31.	•	•	•		•	•
35.	32.	•	•	•		•	•
36.	33.	•	•	•		•	•
37.	34.	•	•	•		•	•
38.	35.	•	•	•		•	•
39.	36.	•	•	•		•	•
40.	37.	•	•	•		•	•
41.	38.	•	•	•		•	•
42.	39.	•	•	•		•	•
43.	40.	•	•	•		•	•
44.	41.	•	•	•		•	•
45.	42.	•	•	•		•	•
46.	43.	•	•	•		•	•
47.	44.	•	•	•		•	•
48.	45.	•	•	•		•	•
49.	46.	•	•	•		•	•
50.	47.	•	•	•		•	•
51.	48.	•	•	•		•	•
52.	49.	•	•	•		•	•
53.	50.	•	•	•		•	•
54.	51.	•	•	•		•	•
55.	52.	•	•	•		•	•
56.	53.	•	•	•		•	•
57.	54.	•	•	•		•	•
58.	55.	•	•	•		•	•
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Study Details 1. Design 2. Years 3. Sampling method 4. Multi-centre? 5. N 6. Age* 7. Gender 8. Setting (community, occupational, clinical, other 9. Study Type (descriptive; health outcomes; correlates) 10. Mother study name	Accelerometry Protocol 1. Device 2. Placement/attachment 3. Other sensors 4. Protocol n Days / hour/day 5. Valid n of days for inclusion 6. Software 7. Processing Method	Accelerometry Variables	Health Outcome Variables	Covariates (confounders) / Mediators / Moderators	Sample Health Status (Descriptors variables)	PA/SB/Sleep Variables collected via Questionnaires	Data sharing
[64]							
1. Prospective 2. Spring 2012- Spring 2013 3. Convenience sampling 4. Multi-centre 5. N:625 6. Age: 44.8 7. Gender: F, M 8. Occupational 9. Health outcomes 10. Danish PHysical ACTivity cohort with Objective measurements (DPhacto) Denmark	1. Actigraph GT3X+ 2. Thigh, dominant upper arm, hip, and trunk 3. - 4. Four to five days, including at least two working days 5. At least 1 day 6. Actilife software version 5.5; a custom-made MATLAB-based software (Acti4) 7. -	• Total time spent walking, climbing stairs, running, cycling, sitting	• Neck shoulder pain	• Age • BMI • Seniority in the current job • Lifting and carrying time at work • Change in physical work tasks over the • 12-month period • Influence and social support at work • The number of days with NSP during the previous 12 months • The number of days with pain • Intake of pain medication		• A diary for noting working hours, leisure time, sleep periods, and time of reference measurement	• Danish Data Protection Agency • accepted the handling and storage of data
[65]							
1. Cross sectional 2. October 2011 to April 2012 3. Convenience sampling 4. Multi-centre 5. N:202 6. Age: 44.8 7. Gender: F, M 8. Occupational 9. Health outcomes 10. New method for Objective Measurements of physical Activity in Daily living (NOMAD) Denmark	1. Actigraph GT3X+ 2. the medial front of the right thigh, midway between the hip and knee joints the trunk (spinous process at the level of T1–T2) water-resistant 3. - 4. Four consecutive days for at least two working days 5. At days were only included if they contained objective measurements for at least 4 h of work 6. Actilife software version 5.5; a custom-made	• Total sitting time	• Neck shoulder pain	• Age • Smoking behaviour • BMI • Seniority in the job • Perceived influence at work • Time spent carrying/ • lifting at work Working with arms raised • Working with • repetitive arm movements • Influence at work			• Available upon request

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Study Details 1. Design 2. Years 3. Sampling method 4. Multi-centre? 5. N 6. Age* 7. Gender 8. Setting (community, occupational, clinical, other 9. Study Type (descriptive; health outcomes; correlates) 10. Mother study name	Accelerometry Protocol 1. Device 2. Placement/attachment 3. Other sensors 4. Protocol n Days / hour/day 5. Valid n of days for inclusion 6. Software 7. Processing Method	Accelerometry Variables	Health Outcome Variables	Covariates (confounders) / Mediators / Moderators	Sample Health Status (Descriptors variables)	PA/SB/Sleep Variables collected via Questionnaires	Data sharing
	MATLAB-based software (Acti4) 7. -						
[66]							
1. Prospective 2. April 2012- May 2014 3. Convenience sampling 4. Multi-centre 5. N:644 6. Age: (median: 47 for no LBP, 46 for LBP) 7. Gender: F, M 8. Occupational 9. Health outcomes 10. Danish PHysical ACTivity cohort with Objective measurements (DPhacto) Denmark	1. ActiGraph GT3x+ 2. the right thigh (medially between the iliac crest and the upper border of the patella), the hip (near the upper point of the iliac crest), the upper back (at processus spinosus below T1) waterproof 3. - 4. For 4–6 days, 24 hours a day 5. Working hours were included if they were ≥4 hours/day (continuous periods) or a duration of ≥75% of average wear time during work across days 6. Actilife software version 5.5; a custom-made MatLab-based software (Acti4) 7. -	• Forward bending • Domain-specific forward bending (work or leisure)	• Low back pain	• Age • Gender • Working conditions (eg, seniority and lift • factor at work) • BMI	• 1-year monthly follow-up on LBP intensity: every four weeks over a 1-year period	• A diary for noting working hours, non-wear time, and sleep periods	• Danish Data Protection Agency • accepted the handling and storage of data
[67]							
1. Prospective 2. - 3. Convenience sampling 4. Multi centre 5. N:1,165 6. Age: 39.9 for construction, 44.5	1. ActiGraph GT3x+ 2. right thigh (medially between the iliac crest and the upper crest of the patella) and right side of the hip (just below iliac crest)	• Minutes spent in sitting and standing positions • Forward bending during work	• Low back pain	• Age • Gender • Seniority in • Profession • BMI • Smoking status	• Self-reported • LBP intensity for the • preceding four weeks		

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for healthcare workers 7. Gender: F, M 8. Occupational 9. Health outcomes 10. a part of a larger prospective cohort study among construction and healthcare workers	3. - 4. 3-4 consecutive days 5. - 6. a custom-made MatLab-based software Acti4 7. -			• Self-reported mechanical exposures Time spent sitting and standing during work • Heavy lifting, • Decision control • Fair and empowering leadership • Social climate in the • organization			

N: sample size; **PA:** physical activity; **SB:** sedentary behaviour; **LBP:** low back pain; **COPD:** Chronic Obstructive Pulmonary Disease; **BMI:** Body Mass Index; **MVPA:** moderate to vigorous physical activity; **EVA:** Exposure Variation Analysis; **T2DM:** Type 2 Diabetes Mellitus; **CVD:** cardiovascular diseases; **NSP:** neck shoulder pain

*Age is given as mean unless otherwise stated.

References

Note: Reference numbers match those used in the primary manuscript

26   Bellettiere J, Winkler EAH, Chastin SFM, *et al.* Associations of sitting accumulation patterns with cardio-metabolic risk biomarkers in Australian adults. *PLoS One* 2017;**12**:1–17. doi:10.1371/journal.pone.0180119

27   Breedveld-Peters JJL, Koole JL, Müller-Schulte E, *et al.* Colorectal cancers survivors' adherence to lifestyle recommendations and cross-sectional associations with health-related quality of life. *Br J Nutr* 2018;**120**:188–97. doi:10.1017/s0007114518000661

28   Çukić I, Shaw R, Der G, *et al.* Cognitive ability does not predict objectively measured sedentary behavior: Evidence from three older cohorts. *Psychol Aging* 2018;**33**:288–96. doi:10.1037/pag0000221

29   De Rooij BH, Van Der Berg JD, Van Der Kallen CJH, *et al.* Physical activity and sedentary behavior in metabolically healthy versus unhealthy obese and non-obese individuals - The Maastricht study. *PLoS One* 2016;**11**:1–12. doi:10.1371/journal.pone.0154358

30   Gale CR, Čukić I, Chastin SF, *et al.* Attitudes to ageing and objectively-measured sedentary and walking behaviour in older people: The lothian birth cohort 1936. *PLoS One* 2018;**13**:1–10. doi:10.1371/journal.pone.0197357

31   Gale CR, Marioni RE, Čukić I, *et al.* The epigenetic clock and objectively measured sedentary and walking behavior in older adults: The Lothian Birth Cohort 1936. *Clin Epigenetics* 2018;**10**:1–6. doi:10.1186/s13148-017-0438-z

32   Gupta N, Christiansen CS, Hallman DM, *et al.* Is objectively measured sitting time associated with low back pain? A cross-sectional investigation in the NOMAD study. *PLoS One* 2015;**10**:1–18. doi:10.1371/journal.pone.0121159

33   Gupta N, Hallman DM, Mathiassen SE, *et al.* Are temporal patterns of sitting associated with obesity among blue-collar workers? A cross sectional study using accelerometers. *BMC Public Health* 2016;**16**:1–10. doi:10.1186/s12889-016-2803-9

34   Gupta N, Heiden M, Mathiassen SE, *et al.* Prediction of objectively measured physical activity and sedentariness among blue-collar workers using survey questionnaires. *Scand J Work Environ Heal* 2016;**42**:237–45. doi:10.5271/sjweh.3561

35   Gupta N, Heiden M, Mathiassen SE, *et al.* Is self-reported time spent sedentary and in physical activity differentially biased by age, gender, body mass index, and low-back pain? *Scand J Work Environ Heal* 2018;**44**:163–70. doi:10.5271/sjweh.3693

36   Gupta N, Heiden M, Aadahl M, *et al.* What is the effect on obesity indicators from replacing prolonged sedentary time with brief sedentary bouts, standing and different types of physical activity during working days? a cross-sectional accelerometer-based study among blue-collar workers. *PLoS One* 2016;**11**:1–18. doi:10.1371/journal.pone.0154935

37   Hallman DM, Birk Jørgensen M, Holtermann A. Objectively measured physical activity and 12-month trajectories of neck-shoulder pain in workers: A prospective study in DPHACTO. *Scand J Public Health* 2017;**45**:288–98. doi:10.1177/1403494816688376

38   Hallman DM, Jørgensen MB, Holtermann A. On the health paradox of occupational and leisure-Time physical activity using objective measurements: Effects on autonomic imbalance. *PLoS One* 2017;**12**:1–16. doi:10.1371/journal.pone.0177042

39   Hallman DM, Mathiassen SE, Gupta N, *et al.* Differences between work and leisure in temporal patterns of objectively measured physical activity among blue-collar workers. *BMC Public Health* 2015;**15**:1–12. doi:10.1186/s12889-015-2339-4

40   Hallman DM, Mathiassen SE, Heiden M, *et al.* Temporal patterns of sitting at work are associated with neck–shoulder pain in blue-collar workers: a cross-sectional analysis of accelerometer data in the DPHACTO study. *Int Arch Occup Environ Health* 2016;**89**:823–33. doi:10.1007/s00420-016-1123-9

41   Hallman DM, Sato T, Kristiansen J, *et al.* Prolonged sitting is associated with attenuated heart rate variability during sleep in blue-collar workers. *Int J Environ Res Public Health* 2015;**12**:14811–27. doi:10.3390/ijerph121114811

42   Hulsegge G, Gupta N, Holtermann A, *et al.* Shift workers have similar leisure-time physical activity levels as day workers but are more sedentary at work. *Scand J Work Environ Heal* 2017;**43**:127–35. doi:10.5271/sjweh.3614

43   Kloster S, Danquah IH, Holtermann A, *et al.* How Does Definition of Minimum Break Length Affect Objective Measures of Sitting Outcomes Among Office Workers? *J Phys Act Heal* 2016;**14**:8–12. doi:10.1123/jpah.2015-0658

44   Korshøj M, Hallman DM, Mathiassen SE, *et al.* Is objectively measured sitting at work associated with low-back pain? A cross sectional study in the DPhacto cohort. *Scand J Work Environ Heal* 2018;**44**:96–105. doi:10.5271/sjweh.3680

45   Loef B, Van Der Beek AJ, Holtermann A, *et al.* Objectively measured physical activity of hospital shift workers. *Scand J Work Environ Heal*

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BMJ Open Sp Ex Med

2018;**44**:265–73. doi:10.5271/sjweh.3709

46   Martens RJH, Van Der Berg JD, Stehouwer CDA, *et al.* Amount and pattern of physical activity and sedentary behavior are associated with kidney function and kidney damage: The Maastricht Study. *PLoS One* 2018;**13**:1–18. doi:10.1371/journal.pone.0195306

47   Mesquita R, Nakken N, Janssen DJA, *et al.* Activity Levels and Exercise Motivation in Patients With COPD and Their Resident Loved Ones. *Chest* 2017;**151**:1028–38. doi:10.1016/j.chest.2016.12.021

48   Munch Nielsen C, Gupta N, Knudsen LE, *et al.* Association of objectively measured occupational walking and standing still with low back pain: a cross-sectional study. *Ergonomics* 2017;**60**:118–26. doi:10.1080/00140139.2016.1164901

49   Pulakka A, Stenholm S, Bosma H, *et al.* Association between Employment Status and Objectively Measured Physical Activity and Sedentary Behavior-The Maastricht Study. *J Occup Environ Med* 2018;**60**:309–15. doi:10.1097/JOM.0000000000001254

50   Rasmussen CL, Palarea-Albaladejo J, Bauman A, *et al.* Does physically demanding work hinder a physically active lifestyle in low socioeconomic workers? A compositional data analysis based on accelerometer data. *Int J Environ Res Public Health* 2018;**15**:1–23. doi:10.3390/ijerph15071306

51   Sawyer A, Smith L, Ucci M, *et al.* Perceived office environments and occupational physical activity in office-based workers. *Occup Med (Chic Ill)* 2017;**67**:260–7. doi:10.1093/occmed/kqx022

52   Shaw RJ, Čukić I, Deary IJ, *et al.* The influence of neighbourhoods and the social environment on sedentary behaviour in older adults in three prospective cohorts. *Int J Environ Res Public Health* 2017;**14**:1–21. doi:10.3390/ijerph14060557

53   Shaw RJ, Cukic I, Deary IJ, *et al.* Relationships between socioeconomic position and objectively measured sedentary behaviour in older adults in three prospective cohorts. *BMJ Open* 2017;**7**:1–10. doi:10.1136/bmjopen-2017-016436

54   Skarpsno ES, Mork PJ, Nilsen TIL, *et al.* Objectively measured occupational and leisure-time physical activity: Cross-sectional associations with sleep problems. *Scand J Work Environ Heal* 2018;**44**:202–11. doi:10.5271/sjweh.3688

55   Smith L, Hamer M, Ucci M, *et al.* Weekday and weekend patterns of objectively measured sitting, standing, and stepping in a sample of office-based workers: the active buildings study. *BMC Public Health* 2015;**15**:9. doi:10.1186/s12889-014-1338-1

56   Smith L, Sawyer A, Gardner B, *et al.* Occupational physical activity habits of UK office workers: Cross-sectional data from the active buildings study. *Int J Environ Res Public Health* 2018;**15**. doi:10.3390/ijerph15061214

57   van der Berg JD, Stehouwer CDA, Bosma H, *et al.* Associations of total amount and patterns of sedentary behaviour with type 2 diabetes and the metabolic syndrome: The Maastricht Study. *Diabetologia* 2016;**59**:709–18. doi:10.1007/s00125-015-3861-8

58   Van Der Berg JD, Van Der Velde JHPM, De Waard EAC, *et al.* Replacement Effects of Sedentary Time on Metabolic Outcomes: The Maastricht Study. *Med Sci Sports Exerc* 2017;**49**:1351–8. doi:10.1249/MSS.0000000000001248

59   Van Der Velde JHPM, Koster A, Van Der Berg JD, *et al.* Sedentary behavior, physical activity, and fitness - The Maastricht study. *Med Sci Sports Exerc* 2017;**49**:1583–91. doi:10.1249/MSS.0000000000001262

60   Varela-Mato V, O'Shea O, King JA, *et al.* Cross-sectional surveillance study to phenotype lorry drivers' sedentary behaviours, physical activity and cardio-metabolic health. *BMJ Open* 2017;**7**:1–9. doi:10.1136/bmjopen-2016-013162

61   Villumsen M, Holtermann A, Samani A, *et al.* Social support modifies association between forward bending of the trunk and low-back pain: Cross-sectional field study of blue-collar workers. *Scand J Work Environ Heal* 2016;**42**:125–34. doi:10.5271/sjweh.3549

62   Villumsen M, Madeleine P, Jørgensen MB, *et al.* The variability of the trunk forward bending in standing activities during work vs. leisure time. *Appl Ergon* 2017;**58**:273–80. doi:10.1016/j.apergo.2016.06.017

63   Villumsen M, Samani A, Jørgensen MB, *et al.* Are forward bending of the trunk and low back pain associated among Danish blue-collar workers? A cross-sectional field study based on objective measures. *Ergonomics* 2015;**58**:246–58. doi:10.1080/00140139.2014.969783

64   Hallman DM, Gupta N, Heiden M, *et al.* Is prolonged sitting at work associated with the time course of neck-shoulder pain? A prospective study in Danish blue-collar workers. *BMJ Open* 2016;**6**:1–9. doi:10.1136/bmjopen-2016-012689

65   Hallman DM, Gupta N, Mathiassen SE, *et al.* Association between objectively measured sitting time and neck–shoulder pain among blue-collar workers. *Int Arch Occup Environ Health* 2015;**88**:1031–42. doi:10.1007/s00420-015-1031-4

66   Lagersted-Olsen J, Thomsen BL, Holtermann A, *et al.* Does objectively measured daily duration of forward bending predict development and aggravation of low-back pain? A prospective study. *Scand J Work Environ Heal* 2016;**42**:528–37. doi:10.5271/sjweh.3591

67   Lunde LK, Koch M, Knardahl S, *et al.* Associations of objectively measured sitting and standing with low-back pain intensity: A 6-month follow-up of construction and healthcare workers. *Scand J Work Environ Heal* 2017;**43**:269–78. doi:10.5271/sjweh.3628