Supplemental Table Mobile physical activity outcomes

Therapeutic Area	Technology	Position of device	Epoch	Study design	Type of clinical study	Other mobile outcomes	Other standard outcome assessment	Use of mobile outcomes	Objectives	Source
Arthritis (Osteoarthritis)	Inertial sensor (Actiwatch-Score)	Not specified	15 seconds	Interventional (RCT)	Quality of life	NA	Pain (PRO, ClinRO) Fatigue (PRO, ClinRO) Mobility (PerfO) General health history (PRO) Physical activity (PerfO) Psychosocial (PRO, ClinRO)	Secondary endpoint	To examine the effectiveness of a tailored activity pacing intervention on fatigue, pain, and physical function, to determine if increased arthritis self-efficacy post intervention is related to improvements in symptom severity and function, and to evaluate the effect of tailored activity pacing on PA for adults with knee and hip OA.	Murphy 2011 [1]
Arthritis (Osteoarthritis) Orthopedics (Arthroscopic partial meniscectomy)	Inertial sensor (Actigraph 7164)	Waist	Not specified	Observational (Case control)	Quality of life	NA	Cardiometabolic and anthropometric measures (ClinRO) Mobility (PRO, ClinRO)	Co-Prim Endpoint	To compare physical activity levels, subject-reported function, and knee strength in 21 arthroscopic partial meniscectomy patients 3 months post-surgery with 21 healthy controls, matched at the cohort level for age, gender and BMI.	Ilich 2012 [2]
Arthritis (Rheumatoid Arthritis)	Inertial sensor (Actigraph Mini-Motionlogger)	Wrist (Non-dominant)	Not specified	Observational (Case control)	Quality of life	NA	Physical activity (PRO) Psychosocial (PRO) Sleep (PRO)	Co-Prim Endpoint	To investigate physical activity measured by an actigraph in patients with RA and in healthy individuals and to investigate the association between actigraphic data and self-reported physical function.	Hashimoto 2015 [3]
Cancer (Breast cancer)	Inertial sensor (Actigraph Model GT1M)	Waist (Non-Dominant Hip)	60 seconds	Interventional (RCT)	Quality of life	NA	Cardiometabolic and anthropometric measures (PRO) Fatigue (PRO) General health history (PRO) Physical activity (PRO) Psychosocial (PRO, ClinRO)	Exploratory endpoint	To longitudinally test a model examining the role of self-efficacy and depression as potential mediators of the relationship between PA and fatigue in a sample of breast cancer survivors using both self-report and objective measures of PA.	Phillips 2013 [4]
Cancer (Breast cancer)	Inertial sensor (ActiGraph GT3X+ accelerometer, Fitbit One)	Various locations (Waistband, bra, pants pocket), Waist	Not specified	Interventional (RCT)	Quality of life	NA	Cardiometabolic and anthropometric measures (ClinRO, Biomarkers) Glucose (Biomarkers) Psychosocial (PRO) Fatigue (PRO) General health history (ObsRO)	Exploratory endpoint To measure adherence to intervention	To examine the effects of a 3-month physical activity intervention compared to a wait list control arm on neuropsychological outcomes and subjective cognitive concerns in breast cancer survivors.	Hartman 2015 [5]

Cancer (Lung cancer)	Inertial sensor (Doorwerth AM101)	Waist (Over the Hip)	Not specified	Interventional (RCT)	Quality of life	NA	Adherence (PRO, Biomarkers) General health history (PRO, ClinRO) Mobility (PRO, ClinRO, PerfO) Psychosocial (PRO, ClinRO)	Co-Prim Endpoint	To investigate effects of an oral nutritional supplement containing n-3 polyunsaturated fatty on quality of life, performance status, handgrip strength and physical activity in patients with non-small cell lung cancer undergoing multimodality treatment.	van der Meij 2013 [6]
Cardiology	Inertial sensor (open access PA dataset available from National Health and Nutrition Examination Survey 2005-6)	Not specified	Not specified	Observational (Cohort study)	Epidemiological	NA	Cardiac (Biomarkers)	Co-Prim Endpoint	To investigate associations between activity regularity and resting systolic blood pressure, as an exemplary well-established cardiovascular risk factor.	Marschollek 2015 [7]
Cardiology	Inertial sensor (activPAL)	Leg or Foot (Thigh)	Not specified	Observational (Cohort study)	Epidemiological	NA	Cardiometabolic and anthropometric measures (Biomarkers)	Exploratory endpoint	To analyse the relationship between objectively measured daily walking duration and cardiovascular Biomarkers of inflammation, cardiac dysfunction and renal impairment.	Klenk 2012 [8]
Cardiology	Inertial sensor (SenseWear™ Mini Armband)	Arm	Not specified	Observational (Cohort study)	Epidemiological	NA	Physical activity (PerfO)	Co-Prim Endpoint	To compare sedentary behaviour and the quantity and quality of daily physical activity among older cardiac patients who were at different stages of recovery following a cardiac event.	Buijs 2015 [9]
Cardiology (Cognitive Functioning and Heart Failure)	Inertial sensor (Actigraph Model GT1M)	Waist (Non-Dominant hip, Right hip)	Not specified	Observational (Cohort study)	Epidemiological	NA	Physical activity (PerfO, PRO) Psychosocial (ClinRO) Cardiac (Biomarkers)	Exploratory endpoint	To determine if decreased levels of physical activity at baseline would predict worse cognitive function and greater reductions in cerebral perfusion among HF patients.	Alosco 2014 [10]
Cardiology (Congenital Heart Defect)	Inertial sensor (Actigraph 7164)	Waist (Right hip)	30 seconds	Observational (Case control)	Quality of life	NA	Cardiometabolic and anthropometric measures (ObsRO)	Exploratory endpoint	To objectively evaluate and describe physical activity levels in children with a stable congenital heart defect and compare those levels with children who do not have a congenital heart defect.	Ewalt 2011 [11]
Cardiology (Coronary Artery Calcification)	Inertial sensor (ActiGraph GT3X+ accelerometer)	Waist (Over the Hip)	Not specified	Observational (Cohort study)	Epidemiological	NA	Cardiometabolic and anthropometric measures ClinRO, Biomarkers) Cardiac (ClinRO, Biomarkers) Glucose (ClinRO, Biomarkers) Physical activity (PRO)	Exploratory endpoint	To determine the relationship between objectively measured physical activity and coronary artery calcium.	Hamer 2012 [12]

Cardiology (Coronary Artery Disease)	Inertial sensor (ActiGraph GT3X+ accelerometer)	Waist (Right hip)	15 seconds	Observational (Cohort study)	Prevention	NA	Cardiometabolic and anthropometric measures (ClinRO, Biomarkers) Cardiac (Biomarkers) Glucose (Biomarkers) Physical activity (PerfO, PRO)	Exploratory endpoint	To quantify sedentary time in a post-cardiac rehabilitation population and assess association with cardiometabolic risk, independent of MVPA.	Prince 2016 [13]
Cardiology (Dyslipidemia)	Inertial sensor (Actical accelerometer)	Waist (Over the Hip)	25 seconds	Interventional (RCT)	Quality of life	NA	Cardiometabolic and anthropometric measures (ClinRO, Biomarkers) Cardiac (Biomarkers) Physical activity (PerfO)	Co-Prim Endpoint	To determine, among statin naive participants, if overall PA levels as measured by an accelerometer decrease in a treatment group receiving Atorvastatin compared with those in the placebo group.	Panza 2016 [14]
Cardiology (Heart Failure)	Inertial sensor (Kionix KXUD9-2050)	Waist	Not specified	Interventional (RCT)	Quality of life	NA	Cardiac (PRO, ClinRO), Biomarkers) Physical activity (PerfO)	Primary endpoint Secondary endpoint	To determine whether extended-release isosorbide mononitrate would enhance the daily activity level in patients with heart failure with a preserved ejection fraction, as assessed by patient-worn accelerometers.	Redfield 2015 [15]
Cardiology (Intermittent Claudication)	Inertial sensor (DynaPort MoveMonitor)	Base of the Spine, Waist	Not specified	Observational (Cohort study)	Prevention	NA	Mobility (ClinRO) Physical activity (ClinRO)	Primary endpoint Secondary endpoint	To investigate the effect of supervised exercise therapy on PA levels and ambulatory activities in patients with intermittent claudication.	Fokkenrood 2015 [16]
Cardiology (Intermittent Claudication)	Inertial sensor (DynaPort MoveMonitor)	Base of the Spine, Waist	100 Hz	Observational (Case control)	Epidemiological	NA	Mobility (ClinRO, PerfO) Physical activity (ClinRO) Psychosocial (ClinRO)	Primary endpoint Secondary endpoint	To quantify, using accelerometer data, daily PA level and energy expenditure of newly diagnosed patients with intermittent claudication and healthy controls. PA outcomes are compared with contemporary public health PA guidelines.	Lauret 2014 [17]
Cardiology (Stroke)	Inertial sensor (ActiGraph GT3X+ accelerometer, SenseWear Armband, activPAL3)	Arm (Nonhemiparetic upper), Waist (Nonhemiparetic Hip)	Not specified	Interventional (RCT)	Treatment (Phase II)	NA	Pain (PRO) Fatigue (PRO) Physical activity (PRO) Sleep (PRO)	Secondary endpoint	To test the safety, feasibility, and effectiveness of an intervention to reduce sitting time in stroke survivors.	English 2016a [18]
Cardiology (Stroke)	Inertial sensor (ActiGraph GT3X+ accelerometer, SenseWear Armband, activPAL3)	Waist (Nonhemiparetic Hip, Right hip)	60 seconds	Observational (Case control)	Epidemiological	NA	Cardiometabolic and anthropometric measures (ClinRO) Physical activity (PRO) Sleep (PRO)	Co-Prim Endpoint	To investigate the amount and pattern of accumulation of sitting time, physical activity, and use of time in people with stroke compared with age-matched healthy peers.	English 2016b [19]

Cardiology (Stroke)	Inertial sensor (ActiGraph GT3X+ accelerometer, SenseWear Armband, activPAL3)	Leg or Foot (Nonparetic Thigh)	Not specified	Observational (Case control)	Quality of life	Mobility (PerfO)	Cardiometabolic and anthropometric measures (ClinRO) Cardiac related endpoints (ClinRO) Mobility related endpoints (ClinRO and PRO)	Exploratory endpoint	To explore the physical, cognitive, and psychological factors associated with daily sitting time and physical activity in people with stroke.	English 2016c [20]
Chronic Fatigue Syndrome	Inertial sensor (Actical accelerometer)	Wrist (Non-dominant)	60 seconds	Observational (Case control)	Quality of life	NA	Cardiometabolic and anthropometric measures (ClinRO) Fatigue (PRO) Pain (PRO) Psychosocial (PRO)	Exploratory endpoint	To compare the activity pattern of patients with chronic fatigue syndrome (CFS) with healthy sedentary subjects and examine the relationship between the different parameters of performed activity (registered by an accelerometer device) and symptom severity and fluctuation (registered by questionnaires) in patients with CFS.	Meeus 2011 [21]
Pulmonology (COPD)	Inertial sensor (ActiGraph GT3X+ accelerometer)	Wrist (Non-dominant)	Not specified	Observational (Cohort study)	Quality of life	NA	Breathing (PRO)	Primary endpoint	To determine if PA, as measured by a wrist-worn accelerometer, is lower during exacerbations in outpatients with COPD than in periods of clinical stability and to define the temporal course of activity limitation after the onset of the exacerbation, if PA decreases.	Ehsan 2013 [22]
Pulmonology (COPD)	Inertial sensor (Actigraph Model GT1M)	Waist	60 seconds	Observational (Case control)	Epidemiological	NA	Cardiometabolic and anthropometric measures ClinRO) Breathing (ClinRO) Physical activity (PerfO)	Co-Prim Endpoint	To assess exercise capacity and physical activity in different stages of COPD and to examine the associations between exercise capacity, pulmonary function and degree of physical activity.	Eliason 2011 [23]
Pulmonology (COPD)	Inertial sensor (Basic Motionlogger)	Wrist (Dominant)	Not specified	Observational (Case control)	Quality of life	NA	Cardiometabolic and anthropometric measures (ClinRO) Breathing (PerfO) Mobility (ClinRO, PerfO, PRO) Physical activity (PRO)	Primary endpoint	To determine whether individuals with COPD have decreased arm activity during daily life compared with healthy controls and explore the relationships between arm activity during daily life and arm functional measures in individuals with COPD.	Janaudis-Ferreira 2016 [24]
Diabetes (Gestational Diabetes)	Inertial sensor (ActiGraph GT3X+ accelerometer)	Waist (Over the Hip)	Not specified	Observational (Cohort study)	Epidemiological	NA	Cardiometabolic and anthropometric measures (ClinRO, Biomarkers) Cardiac (ClinRO, Biomarkers)	Co-Prim Endpoint	To examine the cardiometabolic and inflammatory risk factors associated with accelerometer-based measures of physical activity in women with prior gestational diabetes.	Gingras 2013 [25]

Diabetes (Type 1, Type 2)	Inertial sensor (Actigraph 7164)	Waist	Not specified	Observational (Cohort study)	Epidemiological	NA	Cardiometabolic and anthropometric measures (ClinRO) Cardiac (ClinRO, Biomarkers) Glucose (Biomarkers)	Exploratory endpoint	To investigate associations of accelerometry-derived sedentary time with continuous metabolic variables and metabolic outcomes both cross-sectionally and after 5 years of follow-up in a population-based sample of middle-aged patients recently diagnosed with type 2 diabetes compared with matched controls.	Barone Gibbs 2015 [26]
Diabetes (Type 1, Type 2)	Inertial sensor (StepWatch activity monitor)	Leg or Foot (Ankle)	Not specified	Observational (Cohort study)	Quality of life	NA	Mobility (PerfO) Physical activity (PerfO) Psychosocial (PRO)	Co-Prim Endpoint	To determine whether adults with diabetes and with transtibial amputations (TTAs) are meeting the recommended guidelines for physical activity intensity and daily step counts.	Desveaux 2015 [27]
Diabetes (Type 2)	Inertial sensor (Actiheart combined accelerometer and heart rate monitor)	Chest	60 seconds	Observational (Case control)	Epidemiological	NA	Cardiometabolic and anthropometric measures (ClinRO, Biomarkers) Cardiac (ClinRO, Biomarkers) Glucose (Biomarkers)	Co-Prim Endpoint	To evaluate physical activity in people with newly diagnosed Type 2 diabetes using objective measures.	Cichosz 2013 [28]
Diabetes (Type 2)	Inertial sensor (Actiheart combined accelerometer and heart rate monitor)	Not specified	Not specified	Observational (Case control)	Epidemiological	NA	Cardiac (ClinRO, Biomarkers)	Exploratory endpoint	To evaluate the association between objective measures of physical activity and arterial stiffness in a sample of patients recently diagnosed with type 2 diabetes compared with matched controls.	Funck 2015 [29]
Diabetes (Type 2) Obesity	Inertial sensor (RT3 triaxial accelerometer)	Base of the Spine, Waist	Not specified	Observational (Cohort study)	Epidemiological	NA	Physical activity (PRO, ClinRO, PerfO, Biomarkers)	Primary endpoint	To describe the patterns and correlates of PA in individuals with type 2 diabetes mellitus enrolled in the multi-center Look AHEAD Study using an objective measure of PA (accelerometry).	Jakicic 2010 [30]
Geriatrics	Inertial sensor (Step activity monitor)	Leg or Foot (Ankle)	Not specified	Observational (Cohort study)	Quality of life	NA	Mobility (PRO, ObsRO)	Primary endpoint	To describe the amount and patterns of ambulatory activity in hospitalized older adults over consecutive hospital days.	Fisher 2011 [31]
Geriatrics	Inertial sensor (ActiGraph GT3X+ accelerometer)	Waist (Right hip)	60 seconds	Observational (Cohort study)	Epidemiological	NA	Adherence (PRO) General health history (PRO) Mobility related endpoints (PRO) Physical activity (ClinRO, PRO) Psychosocial (ClinRO, PRO)	Primary endpoint	To examine prevalence of adherence to UK guidelines for MVPA among community-dwelling older men and women, alongside a wide range of correlates using accelerometer data.	Jefferis 2014 [32]

Geriatrics	Inertial sensor (ActiGraph GT3X+ accelerometer)	Waist (Over the Hip)	60 seconds	Observational (Cohort study)	Epidemiological	NA	Cardiometabolic and anthropometric measures (ClinRO) General health history (PRO) Psychosocial (ClinRO, PRO)	Co-Prim Endpoint	To investigate patterns of sedentary behaviour in relation a to key lifestyle factors attributable to older men, as well as physical and mental health status, which are known to be predictors of low PA levels in this population.	Jefferis 2015a [33]
Geriatrics	Inertial sensor (ActiGraph GT3X+ accelerometer)	Waist (Right hip)	60 seconds	Observational (Cohort study)	Epidemiological	NA	Adherence (PRO)	Co-Prim Endpoint	To examine, using objectively measured PA data, average year-on-year changes in the total time and proportion of the day spent in PA of different intensities and changes in the duration of bouts of both MVPA, and SB and we to investigate these year-on-year changes in subgroups of men who did or did not meet the current PA guidelines at each of the time points, in order to examine whether the average annual changes differ in ''high active'' and ''low active'' men.	Jefferis 2015c [34]
Geriatrics	Inertial sensor (ActiGraph GT3X+ accelerometer)	Waist	Not specified	Observational (Cohort study)	Quality of life	NA	Cardiometabolic and anthropometric measures (ClinRO) General health history (PRO) Psychosocial (PRO)	Exploratory endpoint	To examine the longitudinal independent associations of objectively assessed physical activity at different intensities, including MVPA, light physical activity, and sedentary behaviors, with dimensions of subjective well-being in older adults.	Ku 2016 [35]
Geriatrics	Inertial sensor (activPAL)	Leg or Foot (Thigh)	Not specified	Observational (Cohort study)	Epidemiological	NA	Cardiometabolic and anthropometric measures (ClinRO, Biomarkers) Glucose (Biomarkers) General health history (ObsRO, PRO) Mobility (PerfO) Physical activity (PerfO) Psychosocial (ClinRO)	Exploratory endpoint	To analyze the effect of objectively measured walking and sedentary duration on four-year mortality in community dwelling older people and to investigate the potential role of Biomarkers and other functional measures representing different pathophysiologic pathways in this context.	Klenk 2016 [36]
Geriatrics	Inertial sensor (Walking Style Pro HJ-720IT-E2)	Waist	Not specified	Observational (Cohort study)	Epidemiological	NA	Mobility (PerfO)	Primary endpoint	To analyze diurnal profiles of PA for community-dwelling adults aged 70 years and over, and to explore the moderating effect of sex, age, morbidity, mobility limitation, and season on PA throughout the day.	Mai 2014 [37]

Geriatrics (Fall Risk)	Inertial sensor (ActiGraph GT3X+ accelerometer)	Waist (Right hip)	60 seconds	Observational (Cohort study)	Epidemiological	NA	Mobility (ClinRO, PRO) General health history (PRO) Physical activity (ClinRO, PerfO, PRO) Psychosocial (ClinRO, PRO)	Exploratory endpoint	To investigate i) the shape of associations between total amount and intensity of PA and occurrence of falls; ii) whether associations between PA levels and risk of falls differ by age and mobility status; and iii) the role of selected mediators using accelerometer data from a sample of community dwelling older adults.	Jefferis 2015b [38]
Geriatrics (Fall Risk)	Inertial sensor (activPAL)	Leg or Foot (Thigh)	Not specified	Observational (Cohort study)	Epidemiological	Mobility (PerfO)	Mobility (PRO, ClinRO, PerfO) General health history (PRO)	Exploratory endpoint	To investigate the relationship between PA and two measures of fall incidence in an elderly population using person-years as well as hours walked as denominators and to compare these two approaches.	Klenk 2015 [39]
Nephrology (Dialysis)	Inertial sensor (SenseWear Armband)	Arm (Non-Dominant Upper)	Not specified	Observational (Case control)	Epidemiological	NA	Cardiometabolic and anthropometric measures (ClinRO, Biomarkers) Diet (PRO, ClinRO)	Co-Prim Endpoint	To assess interdialytic spontaneous physical activity in stable chronic hemodialysis (HD) patients and the relation to nutritional status and dietary intake	Cupisti 2011 [40]
Nephrology (Dialysis, Kidney transplant)	Heart rate monitor (Suunto T3c) Location monitor (Suunto T3c) Inertial sensor (SenseWear Armband)	Chest (HR and location monitor) Arm (Inertial sensor)	5 second (HR monitor)	Observational (Case control)	Epidemiological	Cardiac (Biomarkers)	Cardiometabolic and anthropometric (Biomarkers) Cardiac (Biomarkers)	Co-Prim Endpoint	To compare the metabolic and hydration status adaptations to 5 repeated trekking sessions in a 7-day expedition into the Algerian desert between kidney transplanted patients and health control subjects.	Mosconi 2011 [41]
Neurology (Multiple Sclerosis)	Inertial sensor (StepWatch activity monitor)	Wrist	Not specified	Observational (Cohort study)	Quality of life	NA	Mobility (PerfO) Physical activity (PerfO)	Co-Prim Endpoint	To examine the effects of IVMP on the recovery of walking ability in patients experiencing MS relapse; to compare, head-to-head, the responsiveness of some walking-based measures applied for MS trails; and to consider their potential implications for clinical trials.	Filipovic Grcic 2011 [42]
Neurology (Parkinson's Disease)	Inertial sensor (DynaPort Hybrid system)	Base of the Spine	60 seconds	Observational (Cohort study)	Screening	Mobility (PerfO)	Mobility (ClinRO, PRO, PerfO) Psychosocial (ClinRO, PRO)	Primary endpoint	To assess the gait pattern of patients who suffer from freezing (i.e., freezers) during routine, daily living community and at-home ambulation and to determine the association between the gait measures and FOG severity and its impact on daily function.	Weiss 2014 [43]

Neurology (Parkinson's Disease)	Inertial sensor (wearable CuPiD system), Pressure sensor (PKMAS walkways)	Leg or Foot (Ankle, Foot), Not Attached to the Body (On the floor)	100 Hz	Interventional (RCT)	Quality of life	Mobility (PerfO)	Adherence (PRO) Mobility (PerfO) Physical (PerfO) Psychosocial (ClinRO)	Primary endpoint	To test the feasibility of training with the CuPiD system in the home environment, and to discover the differential effects of CuPiD training including biofeedback from a wearable device versus conventional home-based gait intervention on gait, balance and HR-QoL in PD.	Ginis 2016 [44]
Nutrition	Inertial sensor (ActiGraph GT3X+ accelerometer)	Waist (Right hip)	Not specified	Interventional (RCT)	Treatment (Phase III)	NA	Cardiometabolic and anthropometric measures (ClinRO) General demographics and parental history (ObsRO, PRO, ClinRO) General health history (ObsRO)	Primary endpoint	To measure the effects of daily dietary supplementation with lipid-based nutrient supplements on 18-month-old children's PA over 12 months.	Pulakka 2015 [45]
Obesity	Inertial sensor (Actigraph 7164, Actigraph Model GT1M)	Base of the Spine, Waist	Not specified	Observational (Cohort study)	Epidemiological	NA	Cardiometabolic and anthropometric measures (ClinRO)	Exploratory endpoint	To examine the independent associations of time spent in MVPA and sedentary time, with total and abdominal body fat, and the bidirectionality of these associations in adults at high risk of type 2 diabetes.	Golubic 2015 [46]
Obesity	Inertial sensor (ActiGraph GT3X+ accelerometer)	Waist	Not specified	Observational (Case control)	Epidemiological	NA	Cardiometabolic and anthropometric measures (ClinRO, Biomarkers) Diet (PRO) Cardiac (ClinROClinRO, Biomarkers) Glucose (Biomarkers) Physical activity (PRO) Sleep (PRO)	Co-Prim Endpoint	To determine whether PA, sedentary behavior and/or diet differ between metabolically healthy and unhealthy overweight and obese young African American and Caucasian women.	Camhi 2015 [47]
Obesity	Inertial sensor (ActiGraph GT3X+ accelerometer, Fitbit One)	Various locations (Waistband, bra, pants pocket), Waist	Not specified	Observational (Cohort study)	Quality of life	NA	Cardiometabolic and anthropometric measures (ClinROClinRO)	Primary endpoint	To assess the trajectory of physical activity adherence across a 16-week self-monitoring intervention, as measured by the Fitbit tracker.	Cadmus-Bertram 2015 [48]
Obesity	Inertial sensor (GENEActiv)	Wrist (Non-dominant)	87.5 Hz	Observational (Cohort study)	Prevention	NA	Cardiometabolic and anthropometric measures (ClinRO) Diet (PRO) Physical activity (PRO) Sleep (PRO) General health	Co-Prim Endpoint	To examine differences in total and MVPA between healthy and unhealthy obese groups by using both self-report and wrist-worn accelerometer assessments.	Bell 2015 [49]

							history (PRO)			
Obesity	Inertial sensor (Kenz Lifecorder-Calorie counter)	Waist	Not specified	Observational (Cohort study)	Epidemiological	NA	Cardiometabolic and anthropometric measures (ClinRO) Diet (PRO) Physical activity (PerfO, ObsRO)	Co-Prim Endpoint	To determine if Japanese rural children would have a higher prevalence of overweight and obesity, a lower daily PA because of lower active commuting, and a higher energy intake compared with Japanese urban children; and if the lower daily PA and lower active commuting are associated with weight status.	Itoi 2012 [50]
Obesity (Postmenopausal Obesity)	Inertial sensor (Actigraph Model GT1M)	Base of the Spine, Waist	Not specified	Observational (Cohort study)	Epidemiological	NA	Cardiometabolic and anthropometric measures (ClinRO, Biomarkers) General health history (PRO, ClinRO) Psychosocial (ClinRO,PRO)	Exploratory endpoint	To establish a relationship between the level of PA, based on an objective measure of number of steps per day using accelerometer, and obesity, measured with the body composition of postmenopausal women.	Kroemeke 2014 [51]
Obesity Physical Activity (PA during pregnancy)	Inertial sensor (Actigraph accelerometer)	Not specified	Not specified	Observational (Cohort study)	Epidemiological	NA	Cardiometabolic and anthropometric measures (ClinRO)	Co-Prim Endpoint	To explore patterns of PA and factors associated with change in PA in obese pregnant women.	Hayes 2015 [52]
Obesity Psychological (Schizophrenia/Schizoaffective Disorder)	Inertial sensor (Actigraph 7164)	Waist (Right hip)	60 seconds	Observational (Cohort study)	Epidemiological	NA	Physical activity (ClinRO, PerfO) Psychosocial (ClinRO, PRO)	Exploratory endpoint	To investigate the association between objectively measured sedentary behavior and psychiatric symptoms in overweight and obese adults with SZO/SA.	Janney 2013 [53]
Orthopedics (Ankle Sprains)	Inertial sensor (activPAL)	Leg or Foot (Thigh)	Not specified	Observational (Case control)	Quality of life	NA	Mobility (ClinRO) Pain (PRO)	Co-Prim Endpoint	To use accelerometers to describe PA in the first week after ankle sprain and to compare results with a healthy control group.	Tully 2012 [54]
Orthopedics (Hip Fracture)	Inertial sensor (activPAL)	Leg or Foot (Nonparetic Thigh)	Not specified	Interventional (RCT)	Quality of life	Mobility (PerfO)	Mobility (ClinRO, PerfO) Pain (ClinRO, PRO)	Primary endpoint	To assess if daily physical behavior as indicated by time spent in upright positions (standing and walking) the fourth day after surgery differed between hip fracture patients treated in a geriatric ward receiving comprehensive geriatric assessment compared with hip fracture patients receiving conventional treatment in an orthopedic ward. To assess differences in	Taraldsen 2014 [55]

									number of upright events during the day and physical function in terms of need for help during ambulation and lower limb functions.	
Orthopedics (Lower Limb Fractures)	Inertial sensor (Actigraph 7164)	Waist (Right hip)	Not specified	Observational (Case control)	Quality of life	NA	Cardiometabolic and anthropometric measures (ClinRO)	Co-Prim Endpoint	To elucidate whether PA levels normalize after bone healing of lower limb fractures in a sample of adolescents, using accelerometry assessments.	Ceroni 2012 [56]
Pediatrics (Adolescent Physical Activity)	Inertial sensor (ActiGraph GT3X+ accelerometer)	Waist (Right hip)	Not specified	Interventional (RCT)	Prevention	NA	Cardiometabolic and anthropometric measures (ClinRO) Psychosocial (ObsRO, PRO)	Exploratory endpoint	To compare the WebDASC-reported EI against TEE as derived from accelerometers on schoolchildren aged 8~11 during two periods of 7 consecutive days: at baseline when the children ate their usual packed lunches and at intervention when children were served NND for school lunch and snacks.	Biltoft-Jensen 2013 [57]
Pediatrics (Adolescent Physical Activity)	Inertial sensor (ActiGraph GT3X+ accelerometer)	Waist (Over the Hip)	30 Hz	Observational (Cohort study)	Epidemiological studies	NA	Meterological information (ObsRO)	Co-Prim Endpoint	To examine how children's objectively-measured PA differed across seasons, and whether different seasonal patterns were observed for boys and girls.	Ridgers 2015 [58]
Pediatrics (Adolescent Physical Activity) Sleep	Inertial sensor (ActiGraph GT3X+ accelerometer)	Waist (Right hip)	60 seconds	Observational (Cohort study)	Epidemiological	Sleep (PerfO)	Cardiometabolic and anthropometric measures (ClinRO) Physical activity (ClinRO) Sleep (PRO, ObsRO)	Co-Prim Endpoint	To examine between-season and within-week variation in physical activity, sedentary behaviour, cardio-respiratory fitness and sleep duration among 8–11 year-old children.	Hjorth 2013 [59]
Pediatrics (Adolescent Physical Activity)	Inertial sensor (Actigraph Model GT1M)	Waist (Right hip)	15 seconds	Observational (Cohort study)	Epidemiological	NA	General demographics and parental history (ObsRO)	Primary endpoint Secondary endpoint	To examine differences in sedentary time and bouts during and outside of childcare/school periods, and changes in sedentary time and bouts over 1-year among children who remained in childcare (childcare subsample) and among those who transitioned to school (school transition subsample)	Carson 2016 [60]

Psychology (Major Depressive Disorder)	Inertial sensor (Ruputer)	Wrist (Non-dominant)	Not specified	Observational (Case control)	Epidemiological	NA	Psychosocial (PRO, ClinRO) Sleep (PRO)	Exploratory endpoint	To investigate psychobehavioral correlates, particularly the statistical associations between momentary depressive mood and behavioral dynamics measured objectively, in patients with major depressive disorder and healthy subjects.	Kim 2015 [61]
Reproductive and peripartum health (C-Reactive Protein in Pregnancy)	Inertial sensor (Actigraph 7164)	Waist (Right hip)	Not specified	Observational (Cohort study)	Prevention	NA	Cardiometabolic and anthropometric measures (Biomarkers) Physical activity (PerfO)	Exploratory endpoint	To evaluate the association between objectively measured physical activity, sedentary behavior, and CRP by pregnancy trimester.	Hawkins 2014 [62]
Reproductive and peripartum health (Postmenopausal Estrogen Metabolism)	Inertial sensor (Actigraph 7164)	Waist	Not specified	Observational (Cohort study)	Epidemiological	NA	Cardiometabolic and anthropometric measures (Biomarkers) General health history (PRO)	Exploratory endpoint	To assess the role of accelerometer-measured physical activity and sedentary behavior on a comprehensive profile of 15 urinary estrogens and EM among postmenopausal women from a population-based breast cancer case control study.	Dallal 2015 [63]
Reproductive and peripartum health (PA among postpartum women	Inertial sensor (Active Australia Survey instrument)	Not specified	4 seconds and 2 minutes	Interventional (RCT)	Prevention	NA	Adherence (ObsRO) Physical activity (PRO) Psychosocial (PRO)	Primary endpoint	To determine if a tailored intervention would significantly increase MVPA more than the standard intervention, as measured by surveys and accelerometers among postpartum ethnic minority women.	Albright 2014 [64]
Sleep (Insomnia)	Inertial sensor (SenseWear Armband)	Arm (Non-Dominant Upper)	Not specified	Interventional (RCT)	Quality of life	Sleep (PerfO)	Psychosocial (PRO, ClinCRO) Sleep (PerfO, PRO, ClinRO) General health history (PRO)	Secondary endpoint	To determine whether nightly administration of melatonin, magnesium, and zinc improves primary insomnia in long-term care facility residents, aged 70 and older.	Rondanelli 2011 [65]

PerfO = Performance Outcome; ObsRO = Observer Reported Outcome; PRO = Patient Reported Outcome; ClinRO = Clinician Reported Outcome

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