maximum values were then summed over 30 s epochs. Epoch values were used for sleep stage classification using the Actiwatch algorithm.

Results: With 1st order butterworth IIR filter with bandwidth 3–11 Hz cross correlation between calculated epoch values between two devices was 0.96. Equation to obtain Actiwatch 30 s epoch data (A) was A = 49G-23, where G was calculated as earlier described. Agreement of wake/sleep classification of 24 h data between devices was 94%. With 2nd order filter results were 0.95, A = 53G-20, and 93%.

Conclusion: New three dimensional accelerometers can be used to obtain activity counts comparable to traditional actigraphs. However new algorithms should be developed and validated against polysomnography to take advantage of additional recorded data. New algorithms could lead to better agreement with polysomnography. While this development is undertaken results comparable to standard actigraphs can be obtained by simple filtering.

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Developing an architectural dosimetry protocol for residential properties in circadian sleep research

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Objectives: To support meaningful associations between lighting parameters and health outcomes, data relating to lighting must be closely related to personal exposure of experimental subjects. Dosimetry devices worn close to the eye are generally agreed to provide the closest match, but represent an intrusive protocol. Consequently behaviour patterns may be affected and compliance impaired. Wrist based devices are less intrusive, but may depart significantly from eye exposures and light sensors may be obscured by long-sleeved clothing. The objective was to develop an architectural dosimetry protocol for circadian studies in residential properties.

Methods: A three location protocol for measuring light levels and broadband spectral data in two main rooms, those primarily used for day and night-time occupation, using actigraphy based dosimetry devices was designed. The criteria considered most important in determining the placement of the devices were, firstly, expectations for typical eye-level and location during room occupancy and, secondly, quantifying the contribution of daylight and artificial light, and room dimensions. Retinal irradiances and spectra determine the effectiveness of light exposures for circadian entrainment, arousal and melatonin suppression. Calibrated measurements were taken with a portable spectroradiometer, to supplement the broadband actigraphy data, and capture data relating to lights, blinds and curtains. Actigraphy devices were individually calibrated, as previously presented.

Results: Examples are given of baseline data for architectural dosimetry including UK care homes and houses of UK retired Class I and II workers. Building on this, comparisons are shown between the protocol data and data from wrist worn actigraphy light measurements collected from the non-intervention stage of a study based at a UK retirement development of houses and flats. The hypothesised differences in light exposures and architectural dosimetry data for the intervention are considered. If available, advance data from the UK retirement home study may be briefly presented.

Conclusions: As the architecture and lighting of residential properties are heterogeneous, home-based studies related to light exposure, including sleep research, should ideally be controlled for the impact on personal light exposures. Protocols for light measurement in architectural spaces also support lighting design using computer software.

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Psychometric properties of a subjective sleep quality index to be used with the elderly: an exploratory study

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Explore the psychometric properties of a sleep quality index to be used with the elderly population. Ninety-nine elderly (mean age, M = 78.65; SD = 6.92; range = 60–95) under social responses in institutions from Coimbra Council accepted to fill in voluntarily a test battery (or whose relatives/caregivers gave consent), including socio-demographic questions, neuropsychological tests and a sleep questionnaire, composed of a sleep quality index (adapted from a sleep index used with undergraduate students) and questions assessing sleep correlates, as sleep hygiene, practice of physical exercise, among others. The sleep index is composed by seven items assessing sleep latency, difficulty in falling asleep, number of night awakenings, waking up spontaneously too early, subjective perception that waking up too early constitutes a problem for the person and two items that evaluate general subjective sleep quality and sleep depth. We slightly rephrased the items from the original index so it could be used with this population (e.g. While having classes, how many times do you awake during the night? ' versus 'How many time do you awake during the night?). The Kaiser-Meyer-Olkin Measure of Sampling Adequacy (should be $\geq$ 0.6; was of 0.830) and the Bartlett's Test of Sphericity value (should be $\leq$ 05; was of $\leq$ 001) allowed us to verify data suitability for factor analysis. A principal components analysis and the scree plot inspection revealed a meaningful one-factor solution (eigenvalue > 1), explaining 48.8% of the total variance. The Component Matrix, presenting each item unrotated loading, showed that all items loaded quite strongly (>0.4). The index revealed a very good internal consistency (Cronbach alpha coefficient; alpha = 0.812). The corrected item-total correlations, which present a degree of correlation of each item with the total score, showed that all presented higher values than 0.3, with the exception of the item assessing sleep depth, indicating that, in general, they are similar as whole. Analyzing Cronbach's alphas when each item was removed, none of them led to a higher alpha value. We decided not to exclude any item. This sleep quality index, adapted for the elderly population, presents good psychometric properties. Since, in terms of assessment, it is important not to overload this population, this very short instrument constitutes a good option to assess sleep quality, filling up a gap regarding instruments in this area.

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Wearable wireless physiological monitoring for chronobiology and sleep

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Objectives: The study of circadian rhythms, continuous monitoring of vital signs or home sleep testing demand continuous non-invasive monitoring of physiological signals. The device has to be ubiquitous