

# Applications of Actigraphy

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## About actigraphy

Actigraphy is the measurement of motion to monitor daily activity and sleep patterns and is usually performed with miniature accelerometers. An actigraphy device is typically worn for several days or weeks on a person's wrist or hip. Motion patterns may be displayed as an actogram that shows daily activity and rest periods. The motion data can be analyzed to provide a variety of objective endpoints about circadian patterns, the level of activity, and nighttime movements. Actigraphy has been used in multiple studies on various disease states.

## Value of actigraphy data in studies of Alzheimer's disease

Alzheimer's disease is a cognitive impairment, but it can manifest itself in many detrimental ways. These include alterations in daytime activity levels, sleep quality, and awake/sleep patterns. These effects of the disease are often the aspects that are most disturbing to the caregivers<sup>4</sup> and are therefore reasonable endpoints for testing the efficacy of therapies<sup>3</sup>. For example, Mahlberg et al. used actigraphy to show a decrease in daytime activity in response to a therapy designed to reduce agitation<sup>6</sup>.

Activity and sleep can also be markers for cognitive symptoms. Zeitzer et al. showed that patient apathy was highly correlated with a specific daytime activity pattern that was independent of depression<sup>7</sup>. Carvalho-Bos used actigraphy to show that the instability of the patient's daily awake/sleep rhythm was related to cognitive decline<sup>2</sup>, and Buchman et al. showed that the level of activity was associated with the onset of Alzheimer's disease in a four-year prospective study of 716 older subjects<sup>1</sup>.

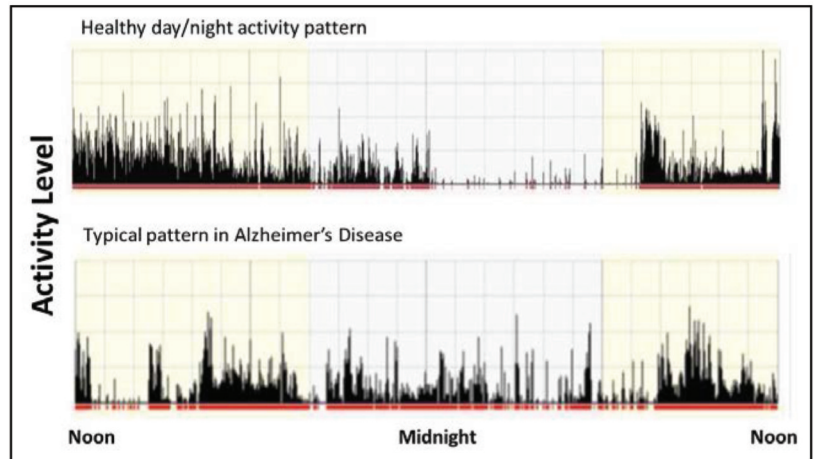
## Published actigraphy endpoints

Total daily activity level<sup>1,5,6</sup>

Functional principal component analysis<sup>7</sup>

Circadian pattern stability<sup>2,3</sup>

Total sleep time, wake after sleep onset<sup>4</sup>



## References

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- 3 David R, Mulin E, Mallea P, Robert PH. Measurement of neuro-psychiatric symptoms in clinical trials targeting Alzheimer's Disease and related disorders. *Pharmaceuticals* 2010; 3: 2387-2397.
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