Medical Coverage Policy | Actigraphy

EFFECTIVE DATE:12|01|2014
POLICY LAST UPDATED: 12|06|2016

OVERVIEW

Actigraphy refers to the assessment of activity patterns by devices typically placed on the wrist or ankle that record body movement, which is interpreted by computer algorithms as periods of sleep (absence of activity) and wake (activity). Sleep/wake cycles may be altered in sleep disorders including insomnia and circadian rhythm sleep disorders. In addition, actigraphy could potentially be used to assess sleep/wake disturbances associated with numerous other diseases or disorders. Actigraphy might also be used to measure the level of physical activity.

PRIOR AUTHORIZATION

Not applicable

POLICY STATEMENT

Blue CHiP for Medicare and Commercial

Actigraphy is considered not medically necessary when used as the sole technique to record and analyze body movement, including but not limited to its use to evaluate sleep disorders. This does not include the use of actigraphy as a component of portable sleep monitoring

When used as a component of portable sleep monitoring, actigraphy should not be separately reported.

MEDICAL CRITERIA

None

BACKGROUND

Actigraphic devices are typically placed on the nondominant wrist with a wristband and are worn continuously for at least 24 hours. Activity is usually recorded for a period of 3 days to 2 weeks but can be collected continuously over extended time periods with regular downloading of data onto a computer. The activity monitors may also be placed on the ankle for the assessment of restless legs syndrome, or on the trunk to record movement in infants. The algorithms for detection of movement are variable among devices and may include "time above threshold," the "zero crossing method," or "digital integration" method, resulting in different sensitivities. Sensitivity settings (eg, low, medium, high, automatic) can also be adjusted during data analysis. The digital integration method reflects both acceleration and amplitude of movement; this form of data analysis may be most commonly used today. Data on patient bed times (lights out) and rise times (lights on) are usually entered into the computer record from daily patient sleep logs or by patient-activated event markers. Proprietary software is then used to calculate periods of sleep based on the absence of detectable movement, along with movement-related level of activity and periods of wake. In addition to providing graphic depiction of the activity pattern, device-specific software may analyze and report a variety of sleep parameters including sleep onset, sleep offset, sleep latency, total sleep duration, and wake after sleep onset. Actigraphy has been used for more than 2 decades as an outcome measure in sleep disorders research.

Regulatory Status

Numerous actigraphy devices have received U.S. Food and Drug Administration (FDA) clearance for marketing through the 510(k) process. Some actigraphy devices are designed and marketed to measure sleep/wake states while others are designed and marketed to measure levels of physical activity. The clinical

validity of actigraphy, the assessment of activity patterns by devices typically placed on the wrist or ankle that record body movement, depends, to a large extent, on the modality with which it is being compared.

Overall, progress has been made since the 2007 American Academy of Sleep Medicine (AASM) research recommendations in assessing the reliability and validity of different algorithms in comparison with the reference standard. Although actigraphy appears to provide reliable measures of sleep onset and wake time in some patient populations, the clinical utility of actigraphy over the less expensive sleep diary has not been demonstrated. Moreover, evidence indicates that actigraphy does not provide a reliable measure of sleep efficiency in clinical populations. Evidence to date does not indicate that this technology is as beneficial as the established alternatives. Therefore, actigraphy is considered not medically necessary as it is investigational.

COVERAGE

BlueCHiP for Medicare and Commercial

Benefits may vary between groups/contracts. Please refer to the Evidence of Coverage or Subscriber Agreement for applicable not medically necessary benefits/coverage

CODING

Blue CHiP for Medicare and Commercial

The following code is not medically necessary:

95803 Actigraphy testing, recording, analysis, interpretation and report (minimum of 72 hours to 14 consecutive days of recording)

RELATED POLICIES

None

PUBLISHED

Provider Update, January 2017
Provider Update, April 2015
Provider Update, January 2015

REFERENCES:

1. Littner M, Kushida CA, Anderson WM, et al. Practice parameters for the role of actigraphy in the study of sleep
and circadian rhythms: an update for 2002. Sleep. May 1 2003;26(3):337-341. PMID 12749556
2. Ancoli-Israel S, Cole R, Alessi C, et al. The role of actigraphy in the study of sleep and circadian rhythms. Sleep.
May 1 2003;26(3):342-392. PMID 12749557
3. Kushida CA, Littner MR, Morgenthaler T, et al. Practice parameters for the indications for polysomnography and
related procedures: an update for 2005. Sleep. Apr 2005;28(4):499-521. PMID 16171294
4. Morgenthaler T, Alessi C, Friedman L, et al. Practice parameters for the use of actigraphy in the assessment of
sleep and sleep disorders: an update for 2007. Sleep. Apr 2007;30(4):519-529. PMID 17520797
5. Morgenthaler TI, Lee-Chiong T, Alessi C, et al. Practice parameters for the clinical evaluation and treatment of
circadian rhythm sleep disorders. An American Academy of Sleep Medicine report. Sleep. Nov 2007;30(11):1445-1459. PMID 18041479
6. Paquet J, Kawinska A, Carrier J. Wake detection capacity of actigraphy during sleep. Sleep. Oct 2007;30(10):1362-1369. PMID 17969470
7. Marino M, Li Y, Rueschman MN, et al. Measuring sleep: accuracy, sensitivity, and specificity of wrist actigraphy
compared to polysomnography. Sleep. Nov 2013;36(11):1747-1755. PMID 24179309

8. Sivertsen B, Omvik S, Havik OE, et al. A comparison of actigraphy and polysomnography in older adults treated
for chronic primary insomnia. Sleep. Oct 2006;29(10):1353-1358. PMID 17068990
9. Kaplan KA, Talbot LS, Gruber J, et al. Evaluating sleep in bipolar disorder: comparison between actigraphy,
polysomnography, and sleep diary. Bipolar Disord. Dec 2012;14(8):870-879. PMID 23167935
10. Taibi DM, Landis CA, Vitiello MV. Concordance of polysomnographic and actigraphic measurement of sleep and
wake in older women with insomnia. J Clin Sleep Med. Mar 15 2013;9(3):217-225. PMID 23493815
11. Louter M, Arends JB, Bloem BR, et al. Actigraphy as a diagnostic aid for REM sleep behavior disorder in Parkinson's disease. BMC Neurol. 2014;14:76. PMID 24708629
12. Beecroft JM, Ward M, Younes M, et al. Sleep monitoring in the intensive care unit: comparison of nurse assessment, actigraphy and polysomnography. Intensive Care Med. Nov 2008;34(11):2076-2083. PMID 18521566
13. van der Kooi AW, Tulen JH, van Eijk MM, et al. Sleep monitoring by actigraphy in short-stay ICU patients. Crit
Care Nurs Q. Apr-Jun 2013;36(2):169-173. PMID 23470702
14. Dick R, Penzel T, Fietze I, et al. AASM standards of practice compliant validation of actigraphic sleep analysis
from SOMNOwatch versus polysomnographic sleep diagnostics shows high conformity also among subjects with
sleep disordered breathing. Physiol Meas. Dec 2010;31(12):1623-1633. PMID 21071830
15. Blackwell T, Ancoli-Israel S, Redline S, et al. Factors that may influence the classification of sleep-wake by wrist
actigraphy: the MrOS Sleep Study. J Clin Sleep Med. Aug 15 2011;7(4):357-367. PMID 21897772
16. Plante DT. Leg actigraphy to quantify periodic limb movements of sleep: a systematic review and meta-analysis.
Sleep Med Rev. Oct 2014;18(5):425-434. PMID 24726711
17. Levenson JC, Troxel WM, Begley A, et al. A quantitative approach to distinguishing older adults with insomnia
from good sleeper controls. J Clin Sleep Med. Feb 1 2013;9(2):125-131. PMID 23372464
18. O'Driscoll DM, Foster AM, Davey MJ, et al. Can actigraphy measure sleep fragmentation in children? Arch Dis
Child. Dec 2010;95(12):1031-1033. PMID 19850594
19. Hyde M, O'Driscoll DM, Binette S, et al. Validation of actigraphy for determining sleep and wake in children with
sleep disordered breathing. J Sleep Res. Jun 2007;16(2):213-216. PMID 17542951
20. Belanger ME, Bernier A, Paquet J, et al. Validating actigraphy as a measure of sleep for preschool children. J
Clin Sleep Med. Jul 15 2013;9(7):701-706. PMID 23853565
21. Insana SP, Gozal D, Montgomery-Downs HE. Invalidity of one actigraphy brand for identifying sleep and wake
among infants. Sleep Med. Feb 2010;11(2):191-196. PMID 20083430
22. Spruyt K, Gozal D, Dayyat E, et al. Sleep assessments in healthy school-aged children using actigraphy: concordance with polysomnography. J Sleep Res. Mar 2011;20(1 Pt 2):223-232. PMID 20629939
23. Werner H, Molinari L, Guyer C, et al. Agreement rates between actigraphy, diary, and questionnaire for children's
sleep patterns. Arch Pediatr Adolesc Med. Apr 2008;162(4):350-358. PMID 18391144
24. Short MA, Gradisar M, Lack LC, et al. The discrepancy between actigraphic and sleep diary measures of sleep in
adolescents. Sleep Med. Apr 2012;13(4):378-384. PMID 22437142

25. Sung M, Adamson TM, Horne RS. Validation of actigraphy for determining sleep and wake in preterm infants.
Acta Paediatr. Jan 2009;98(1):52-57. PMID 18754828
26. Sitnick SL, Goodlin-Jones BL, Anders TF. The use of actigraphy to study sleep disorders in preschoolers: some
concerns about detection of nighttime awakenings. Sleep. Mar 2008;31(3):395-401. PMID 18363316
27. Sadaka Y, Sadeh A, Bradbury L, et al. Validation of actigraphy with continuous video-electroencephalography in
children with epilepsy. Sleep Med. Sep 2014;15(9):1075-1081. PMID 24974198
28. Schutte-Rodin S, Broch L, Buysse D, et al. Clinical guideline for the evaluation and management of chronic
insomnia in adults. J Clin Sleep Med. Oct 15 2008;4(5):487-504. PMID 18853708