



Complete Summary

GUIDELINE TITLE

Practice parameters for the role of actigraphy in the study of sleep and circadian rhythms: an update for 2002.

BIBLIOGRAPHIC SOURCE(S)

Littner M, Kushida CA, Anderson WM, Bailey D, Berry RB, Davila DG, Hirshkowitz M, Kapen S, Kramer M, Loubé D, Wise M, Johnson SF. Practice parameters for the role of actigraphy in the study of sleep and circadian rhythms: an update for 2002. *Sleep* 2003 May; 26(3): 337-41. [3 references] [PubMed](#)

COMPLETE SUMMARY CONTENT

SCOPE
METHODOLOGY - including Rating Scheme and Cost Analysis
RECOMMENDATIONS
EVIDENCE SUPPORTING THE RECOMMENDATIONS
BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS
QUALIFYING STATEMENTS
IMPLEMENTATION OF THE GUIDELINE
INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT
CATEGORIES
IDENTIFYING INFORMATION AND AVAILABILITY

SCOPE

DISEASE/CONDITION(S)

- Insomnia
- Circadian rhythm sleep disorders
- Excessive sleepiness

GUIDELINE CATEGORY

Diagnosis
Evaluation

CLINICAL SPECIALTY

Internal Medicine
Neurology
Nursing
Psychiatry

Psychology
Sleep Medicine

INTENDED USERS

Advanced Practice Nurses
Physicians
Psychologists/Non-physician Behavioral Health Clinicians

GUIDELINE OBJECTIVE(S)

To present recommendations regarding the use of actigraphy in the clinical assessment of sleep disorders

TARGET POPULATION

Adults with known or suspected sleep disorders

INTERVENTIONS AND PRACTICES CONSIDERED

Actigraphy

MAJOR OUTCOMES CONSIDERED

Clinical utility of actigraphy for diagnosing sleep disorders.

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Hand-searches of Published Literature (Primary Sources)
Hand-searches of Published Literature (Secondary Sources)
Searches of Electronic Databases

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

This guideline updates the 1995 American Academy of Sleep Medicine's (AASM) Practice Parameters for the Use of Actigraphy in the Clinical Assessment of Sleep Disorders. A Medline literature search was conducted from the year 1995 to April 2002. Key words for the Medline search included actigraphy, actigraph, actigraphic recording, actimeter, actometer, wrist actigraph, actigraph recording, wrist activity, rest activity, activity, and sleep-wake activity, each paired with sleep, sleep disorders and sleep disorders-circadian. Articles published prior to the original 1995 AASM guideline were not included in the current update, and only articles written in English were included.

A total of 171 articles were identified as potentially relevant based on these Medline searches. All of these were obtained in full length and examined. Upon review of these articles, approximately 30 additional references were discovered by perling (i.e., checking the reference sections for articles otherwise missed).

These were references located in publications not typically found through Medline. In an attempt to include all articles matching the stated criteria, task force members also added any articles they discovered through their personal review of the literature. All new articles published up to the point of the final draft of this manuscript (July 2002) were reviewed.

Only papers where actigraphs were used to measure some aspect of sleep/wake activity or circadian rhythms were included. Papers that only measured activity (without any reference to sleep) or that made measurements only in the daytime were excluded. Only papers published in English, in peer-reviewed journals, were included. Case studies and review articles were included in the narrative, but not in the evidence tables. No conference abstracts, even if published, were included.

NUMBER OF SOURCE DOCUMENTS

189

METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Expert Consensus
Weighting According to a Rating Scheme (Scheme Given)

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

The classification of evidence was adapted from the suggestions of Sackett (Sackett D. Rules of evidence and clinical recommendation. *Can J Cardiol* 1993;9: 487-489) and modified by Ancoli-Israel et al. (2003 -- see "Companion Documents" field) to fit the actigraphy literature.

Levels of Evidence for Actigraphy

Level 1 (Grade A Recommendation)

Blind, prospective comparison of results obtained by actigraphy to those obtained by a reference standard* on an appropriate spectrum of subjects and number of patients.

Level 2 (Grade B Recommendation)

Blind, prospective comparison of results obtained by actigraphy to those obtained by a reference standard* on a limited spectrum of subjects or number of patients.

Level 3 (Grade C Recommendation)

Comparison of results obtained by actigraphy to those obtained by a reference standard*, but not blind, not prospective or otherwise methodologically limited.

Level 4 (Grade C Recommendation)

a - Adequate comparison of results obtained by actigraphy to those obtained by a non-standard reference*; or
b - Actigraphy not compared to any reference, but actigraph results demonstrated ability to detect significant difference between groups or conditions in well-designed trial.

Level 5 (Grade D Recommendation)

Actigraphy not adequately compared to any reference, and either

a - Actigraph not used in a well-designed trial, or

b - Actigraph used in such a trial but did not demonstrate ability to detect significant difference between groups or conditions.

*Reference standards for actigraphic evaluation of sleep and circadian rhythms may include, as appropriate, polysomnography, oximetry, melatonin rhythms, core body temperature rhythms, and/or other generally accepted "gold standards," applied in an acceptable manner. Non-standard references include such items as sleep logs, spousal reports, other experimental monitors, etc.

METHODS USED TO ANALYZE THE EVIDENCE

Systematic Review

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

Collected papers that had been identified as potentially relevant were categorized into four sections: Technology, Sleep Disorders, Circadian Rhythms, and Other Clinical Research. Within each category, task force members were assigned to read each paper, summarize the relevant points for the evidence tables and rate the study according to the evidence levels shown in Table 1 of the companion review document. Abbreviations used in the evidence tables are described in Appendix A in the companion review document (see the "Companion Documents" field).

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Expert Consensus

DESCRIPTION OF METHODS USED TO FORMULATE THE RECOMMENDATIONS

When scientific data were absent, insufficient, or inconclusive, the recommendations were based on consensus opinion.

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

The American Academy of Sleep Medicine (AASM) Levels of Recommendations are defined as standards, guidelines, and options:

Standard

This is a generally accepted patient-care strategy, which reflects a high degree of clinical certainty. The term, standard generally implies the use of Level I Evidence, which directly addresses the clinical issue, or overwhelming Level II Evidence.

Guideline

This is a patient-care strategy, which reflects a moderate degree of clinical certainty. The term guideline implies the use of Level II Evidence or a consensus of Level III Evidence.

Option

This is a patient-care strategy, which reflects uncertain clinical use. The term option implies either inconclusive or conflicting evidence or conflicting expert opinion.

COST ANALYSIS

A formal cost analysis was not performed and published cost analyses were not reviewed.

METHOD OF GUIDELINE VALIDATION

External Peer Review
Internal Peer Review

DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

These guideline recommendations were reviewed and approved by the Board of Directors of the American Academy of Sleep Medicine (AASM).

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

The following are recommendations of the American Academy of Sleep Medicine. Recommendations are given as standards, guidelines and options, as defined below.

1. Actigraphy is reliable and valid for detecting sleep in normal, healthy adult populations. (Standard) [Ancoli-Israel et al., 2003; Sections 4.2, 4.3; and Table 2]
2. Actigraphy is not indicated for the routine diagnosis, assessment of severity, or management of any of the sleep disorders. However, it may be useful in the assessment of specific aspects of the following disorders. (a) Insomnia -- assessment of sleep variability, measurement of treatment effects, and detection of sleep phase alterations in insomnia secondary to circadian rhythm disturbance. (b) Restless legs syndrome/periodic limb movement disorder -- assessment of treatment effects. (Guideline) [Ancoli-Israel et al., 2003; Sections 4.6, 5.1, 5.2, 5.5, 5.6, 6.3; and Tables 2, 3]
3. Actigraphy may be a useful adjunct to a detailed history, examination, and subjective sleep diary for the diagnosis and treatment of insomnia, circadian-rhythm disorders, and excessive sleepiness under certain conditions: (a) When demonstration of multiday rest-activity patterns is necessary to diagnose, document severity and guide the proper treatment. (b) When more objective information regarding the day-to-day timing, amount or patterns of a patient's sleep is necessary for optimal clinical decision-making. (c) When

- the severity of a sleep disturbance reported by the patient or caretaker seems inconsistent with clinical impressions or laboratory findings. (d) To clarify the effects of, and (under some instances) compliance with, pharmacologic, behavioral, phototherapeutic or chronotherapeutic treatment. (e) In symptomatic patients for whom an accurate history cannot be obtained and in whom polysomnographic study has already been conducted, or is considered unlikely to be of much diagnostic benefit, or is not yet clearly indicated (because of the absence of accurate historical data) or is not immediately available. (Option)
4. The use of actigraphy may be useful in assessing daytime sleepiness in situations where a more standard technique, such as the multiple sleep latency test, is not practical. (Option) [Ancoli-Israel et al., 2003; Section 4.5; and Table 2]
 5. Superiority of actigraphy placement on different parts of the body is not currently established. (Guideline) [Ancoli-Israel et al., 2003; Section 4.7; and Table 2]
 6. Actigraphy is an effective means of demonstrating multiday human rest-activity patterns and may be used to estimate sleep-wake patterns in clinical situations where a sleep log, observations, or other methods cannot provide similar information. However, concomitant completion of a sleep log during the period of actigraphy use provides important supplemental data for the purpose of artifact rejection and for marking bedtime and lights on, which in turn, allows the accurate determination of sleep parameters by actigraphy. (Option) [Ancoli-Israel et al., 2003; Sections 4.3, 4.4, 4.8, 4.9, 6.1, 6.2, 6.3; and Tables 2, 4]
 7. Actigraphy may be useful in characterizing and monitoring circadian rhythm patterns or disturbances in the following special populations: (a) the elderly and nursing home patients with and without dementia; (b) newborns, infants, children, and adolescents; (c) hypertensive individuals; (d) depressed or schizophrenic patients; and (e) individuals in inaccessible situations (e.g., space flight). (Option) [Ancoli-Israel et al., 2003; Sections 4.3, 4.4, 4.9, 5.3, 6.1, 6.2, 6.5, 6.6, 6.7, 6.8; and Tables 2-4]
 8. Actigraphy appears useful as an outcome measure in: (a) interventional trials in patients with sleep disorders; (b) outcome studies of healthy adults; (c) patients with certain medical and psychiatric conditions; and (d) children and the elderly. (Option) [Ancoli-Israel et al., 2003; Sections 4.6, 5.1-5.5, 7.1-7.8; and Tables 2, 3, 5]
 9. Actigraphy may be useful in determining the rest-activity pattern during portable sleep apnea testing. However, the use of actigraphy alone in the detection of obstructive sleep apnea is not currently established. (Option) [Ancoli-Israel et al., 2003; Section 5.4; and Table 3]
 10. Actigraphic studies should be conducted for a minimum of three consecutive 24-hour periods, but this length of time is highly dependent upon the specific use in a given individual. (Option) [Ancoli-Israel et al., 2003; Section 4.4; and Table 2]
 11. Inspection of raw data following procedures outlined, and algorithms validated for, the specific device in use is necessary. Some preprocessing of movement counts is acceptable, and epoch lengths up to 1 minute are usually sufficient except for circadian rhythm assessment. Automatic scoring may be used in addition to manual methods of scoring. (Option) [Ancoli-Israel et al., 2003]

Definitions

The American Academy of Sleep Medicine (AASM) Levels of Recommendations are defined as standards, guidelines, and options:

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This is a generally accepted patient-care strategy, which reflects a high degree of clinical certainty. The term, standard generally implies the use of Level I Evidence, which directly addresses the clinical issue, or overwhelming Level II Evidence.

Guideline

This is a patient-care strategy, which reflects a moderate degree of clinical certainty. The term guideline implies the use of Level II Evidence or a consensus of Level III Evidence.

Option

This is a patient-care strategy, which reflects uncertain clinical use. The term option implies either inconclusive or conflicting evidence or conflicting expert opinion.

CLINICAL ALGORITHM(S)

None provided

EVIDENCE SUPPORTING THE RECOMMENDATIONS

REFERENCES SUPPORTING THE RECOMMENDATIONS

[References open in a new window](#)

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

The recommendations are based on evidence from studies published in peer-reviewed journals that were evaluated as noted in the evidence tables of the companion review paper. However, when scientific data were absent, insufficient, or inconclusive, the recommendations are based upon consensus opinion.

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

Appropriate use of actigraphy in the evaluation of sleep disorders. Actigraphy may be a useful adjunct to a detailed history, examination, and subjective sleep diary for the diagnosis and treatment of insomnia, circadian-rhythm disorders, and excessive sleepiness in specific clinical scenarios.

POTENTIAL HARMS

Potential harms are not anticipated.

QUALIFYING STATEMENTS

QUALIFYING STATEMENTS

These guidelines define principles of practice that should meet the needs of most patients in most situations. These guidelines should not, however, be considered inclusive of all proper methods of care or exclusive of other methods of care reasonably directed toward obtaining the same results. The ultimate judgment regarding the propriety of any specific procedure must be made by the physician in light of the individual circumstances presented by the patient and the available diagnostic and treatment options as resources.

IMPLEMENTATION OF THE GUIDELINE

DESCRIPTION OF IMPLEMENTATION STRATEGY

An implementation strategy was not provided.

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

IOM CARE NEED

Getting Better
Living with Illness

IOM DOMAIN

Effectiveness

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

Littner M, Kushida CA, Anderson WM, Bailey D, Berry RB, Davila DG, Hirshkowitz M, Kapen S, Kramer M, Loubé D, Wise M, Johnson SF. Practice parameters for the role of actigraphy in the study of sleep and circadian rhythms: an update for 2002. *Sleep* 2003 May; 26(3): 337-41. [3 references] [PubMed](#)

ADAPTATION

Not applicable: Guideline was not adapted from another source.

DATE RELEASED

1995 (revised 2003 May 1)

GUIDELINE DEVELOPER(S)

American Academy of Sleep Medicine - Professional Association

SOURCE(S) OF FUNDING

American Academy of Sleep Medicine

GUIDELINE COMMITTEE

Standards of Practice Committee of the American Academy of Sleep Medicine

COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

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FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

All authors of this review, members of the Standards of Practice Committee, and the American Academy of Sleep Medicine (AASM) Board of directors completed detailed conflict-of-interest statements and were found to have none with regard to this subject.

GUIDELINE STATUS

This is the current release of this guideline.

This guideline updates a previous version: American Sleep Disorders Association. Practice parameters for the use of actigraphy in the clinical assessment of sleep disorders. *Sleep* 1995 May; 18(4): 285-7.

GUIDELINE AVAILABILITY

Electronic copies: Available in Portable Document Format (PDF) from the [American Academy of Sleep Medicine Web site](#).

Print copies: Available from the Standards of Practice Committee, American Academy of Sleep Medicine, One Westbrook Corporate Center, Suite 920, Westchester, IL 60154. Web site: www.aasmnet.org.

AVAILABILITY OF COMPANION DOCUMENTS

The following technical review is available:

- The role of actigraphy in the study of sleep and circadian rhythms. *Sleep* 2003 May; 26(3): 342-92.

Electronic copies: Available in Portable Document Format (PDF) from the [American Academy of Sleep Medicine Web site](#).

Print copies: Available from the Standards of Practice Committee, American Academy of Sleep Medicine, One Westbrook Corporate Center, Suite 920, Westchester, IL 60154. Web site: www.aasmnet.org.

PATIENT RESOURCES

None available

NGC STATUS

This summary was completed by ECRI on April 25, 1999. The information was verified by the guideline developer on May 24, 1999. This summary was updated by ECRI on August 30, 2003. The updated information was verified by the guideline developer on August 29, 2003.

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Date Modified: 11/1/2004

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