Insightful data for more effective assessment

Actigraphy reference guide

PHILIPS

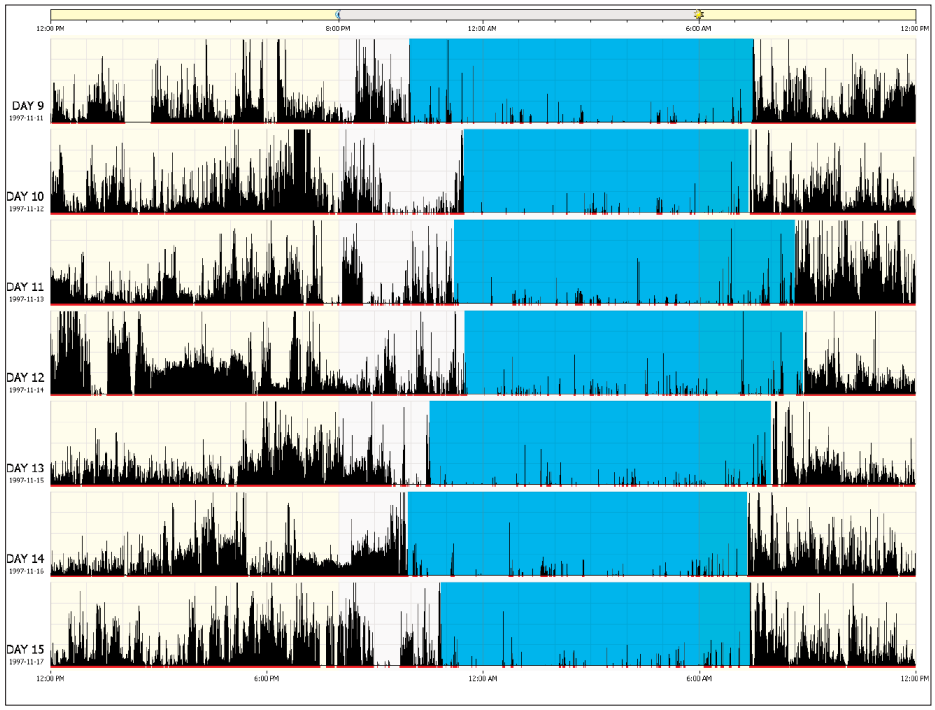
RESPIRONICS

Actigraphy examples

Many patients with circadian rhythm disorders, hypersomnia, insomnia and narcolepsy present with similar symptoms. Patterns of rest and activity, shown in actograms as well as in sleep history statistics from actigraphy, can help you to more effectively assess the type of sleep disorder occurring in these patients as well as document treatment effects. These examples represent the rest-activity patterns of a normal sleeper and patients with various sleep disorders. These patterns were recorded with an Actiwatch device which was worn on the patient's wrist.

Normal sleeper

Humans typically display a pronounced decrease in activity during rest. Rest periods are characterized by small intermittent movements while active periods show significant, constant movement. Rest and activity together display a pattern that is relatively stable over the 24-hour-day for normal sleepers. In the example to the right, from a typical normal sleeper, a relatively stable rest-activity cycle is shown. The actogram is a graphical tool that allows for the rapid identification of this 24-hour pattern. Activity during rest periods is reduced when compared to the active periods. Additionally, rest periods commonly occur between 2100 hours and 0800 hours with some variation for weekends.



Normal sleeper

Sleep statistics for a normal sleeper

Sleep statistics for identified sleep intervals are generated by scoring algorithms validated in patients with sleep disorders and infants. When used along with the actogram, these statistics provide objective documentation of sleep history to help shape treatment strategies during diagnosis, treatment and follow up. This objective evidence is used to inform the patient of the impact of behavioral, social, or environmental factors upon sleep patterns, quantity, and quality.

Rest | Active | **Sleep** | Custom

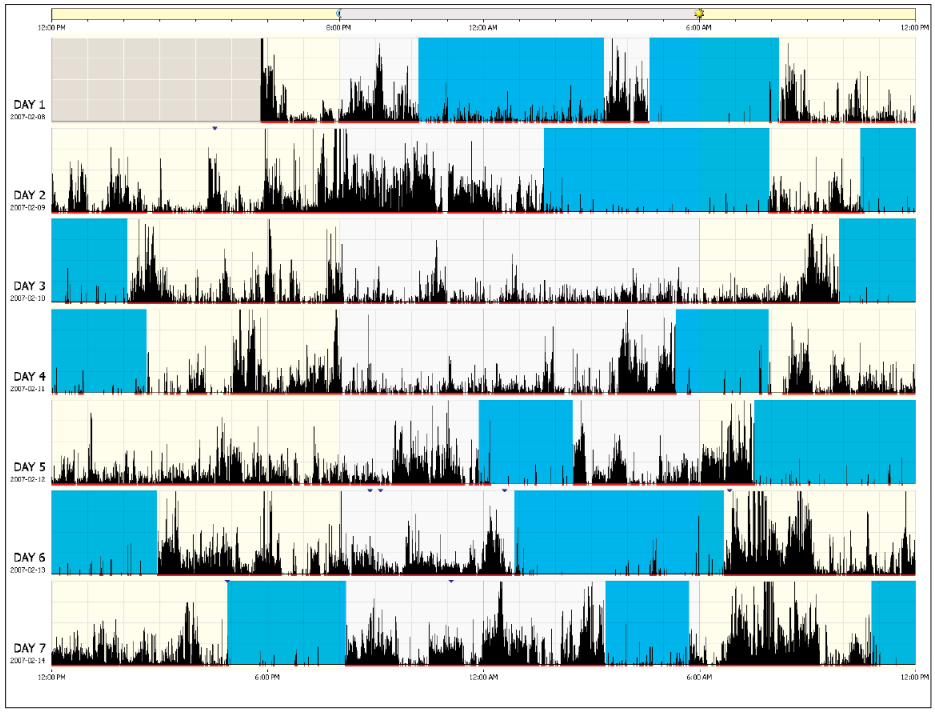
	Start Date	Start Time	End Date	End Time	Duration	Onset Latency	Efficiency	WASO	#Wake Bouts	Sleep Time
Interval 1	1997-11-11	10:49:00 PM	1997-11-12	7:29:00 AM	520.00	51.00	74.65	93.00	29	427.00
Interval 2	1997-11-12	11:29:00 PM	1997-11-13	7:21:00 AM	472.00	0.00	83.93	75.00	31	397.00
Interval 3	1997-11-13	11:36:00 PM	1997-11-14	8:14:00 AM	518.00	24.00	71.48	112.00	35	406.00
Interval 4	1997-11-14	11:38:00 PM	1997-11-15	8:43:00 AM	545.00	7.00	73.67	131.00	52	414.00
Interval 5	1997-11-15	10:38:00 PM	1997-11-16	6:44:00 AM	486.00	5.00	72.61	75.00	35	411.00
Interval 6	1997-11-16	10:29:00 PM	1997-11-17	7:19:00 AM	530.00	33.00	75.89	102.00	33	428.00
Interval 7	1997-11-17	11:19:00 PM	1997-11-18	7:24:00 AM	485.00	27.00	76.61	92.00	34	393.00
Interval 8	1997-12-15	11:03:00 PM	1997-12-16	6:46:00 AM	463.00	10.00	78.96	84.00	30	379.00
n	*	*	*	*	8	8	8	8	8	8
Average(n)	*	*	*	*	502.38	19.63	75.97	95.50	34.88	406.88
Std Dev(n-1)	*	*	*	*	29.71	17.27	3.99	19.15	7.28	16.85

Commonly used statistics

Sleep time, sleep efficiency, wake after sleep onset, number of wake bouts, sleep onset latency

Insomniac

For patients with sleep disorders, rest and activity data display an unstable or shifted pattern that is easy to see on an actogram. Activity depicts elevated levels at just about any time of day. Rest periods are variable in length and timing.



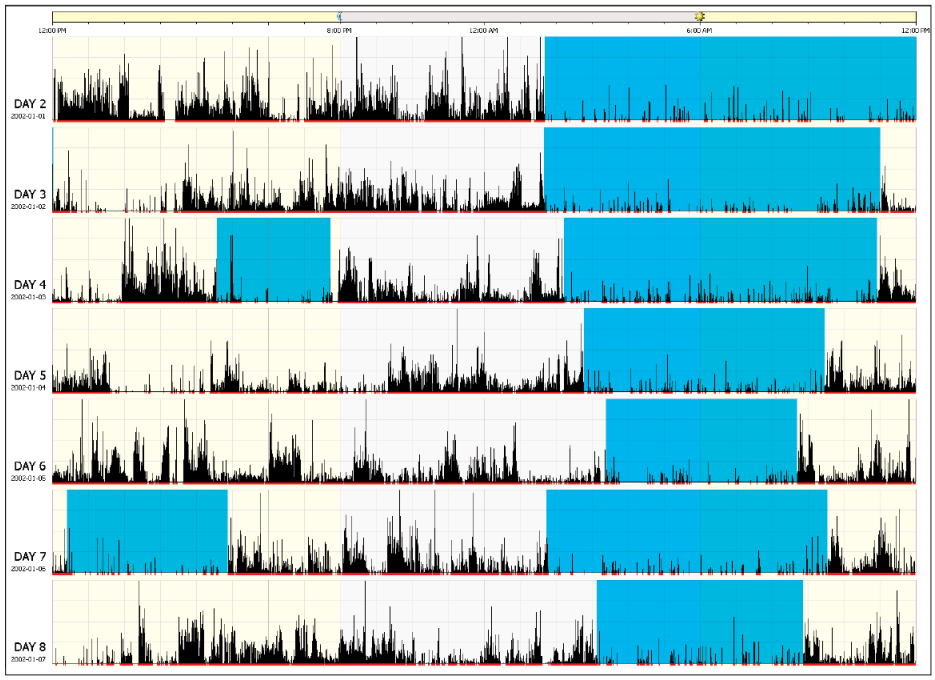
Insomniac

Circadian disorder – Delayed Sleep Phase (DSP) type

Occurs in 7%-16% of adolescent/young adults

Occurs in 10% of patients with chronic insomnia

Delayed sleep phase is typified by a sleep/wake pattern where sleep onset and wake times are delayed 3-6 hours relative to normal sleep-wake times. In this example, sleep periods are highlighted in aqua. Patients with DSP initiate sleep between 0400 hours and 0600 hours and wake up between 1100 hours and 1500 hours. This type of delay may be due to circadian function or behaviorally-induced sources. An actigraphy record of seven or more days can help identify DSP patients for treatment with light therapy, chronotherapy or melatonin. It can also track changes in the patient's sleep/wake pattern once these treatments have been initiated.



Circadian disorder – Delayed Sleep Phase (DSP) type

Citations:

The International Classification of Sleep Disorders Diagnostic and Coding Manual 2nd Edition American Academy of Sleep Medicine, Westchester, Illinois. 2005

Principles and Practices of Sleep Medicine Fourth Edition Edited by Meir H Kryger, Thomas Roth, William Dement Copyright 2005 Elsevier, Inc., Philadelphia, PA Chapter 124, PP. 1459-1467

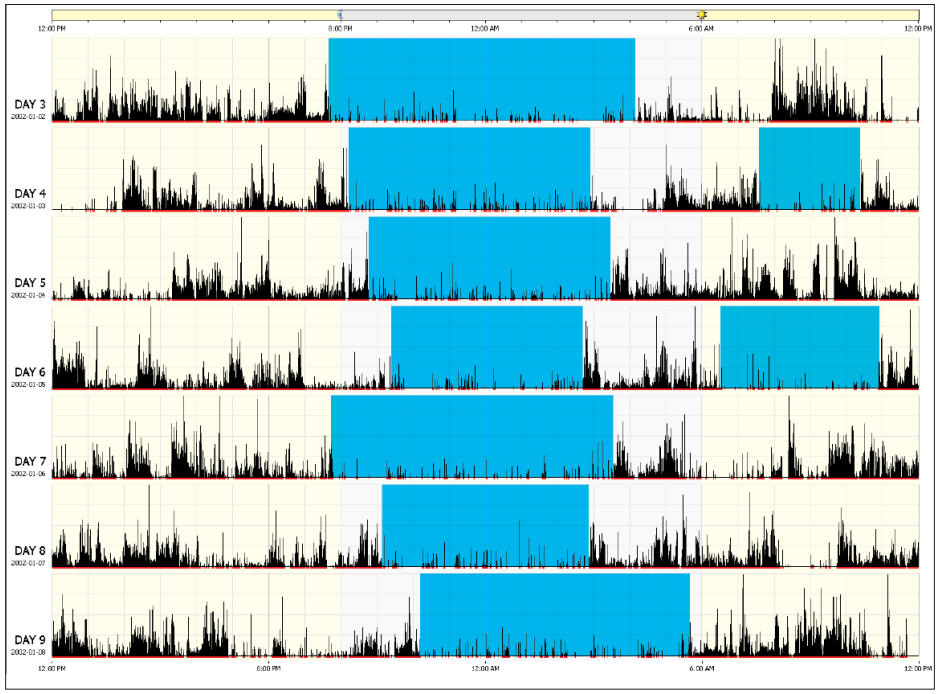
Circadian disorder – Advanced Sleep Phase (ASP) type

Occurs in 1% of population

More common in older adults

Advanced sleep phase is typified by a sleep/wake pattern where sleep onset and wake times are more than three hours earlier than normal. Sleep is typically initiated by 2000 hours and the patient wakes up very early in the morning often by 0300 hours.

An actigraphy record of seven or more days can help identify ASP patients for treatment with light therapy, chronotherapy or melatonin. It can also track changes in the patient's sleep/wake pattern once these treatments have been initiated.



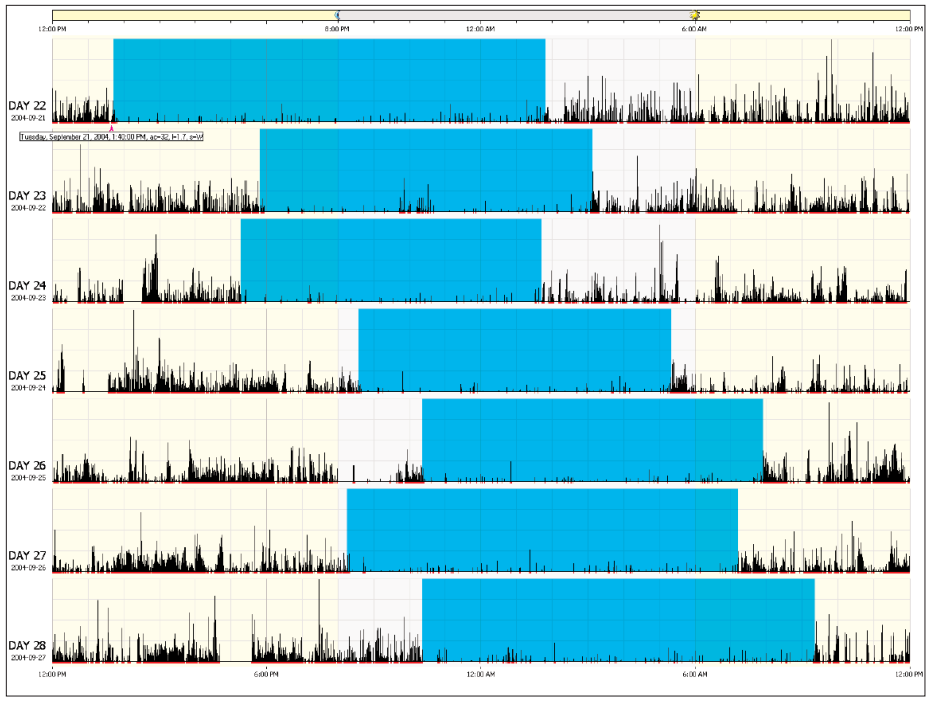
Circadian disorder – Advanced Sleep Phase (ASP) type

Circadian disorder – Non-24-hour or nonentrained type

Most common in blind patients

A nonentrained circadian rhythm is typified by the lack of a stable relationship between the 24-hour light and dark cycle and the circadian pacemaker. Shown here is a classic example where the rest periods recur at a period that is greater than 24 hours. This results in a shifting of the rest periods later each day.

An actigraphy record of seven or more days can help identify these patients for treatment with melatonin. It can also track changes in the patient's sleep/wake pattern once treatment has been initiated.



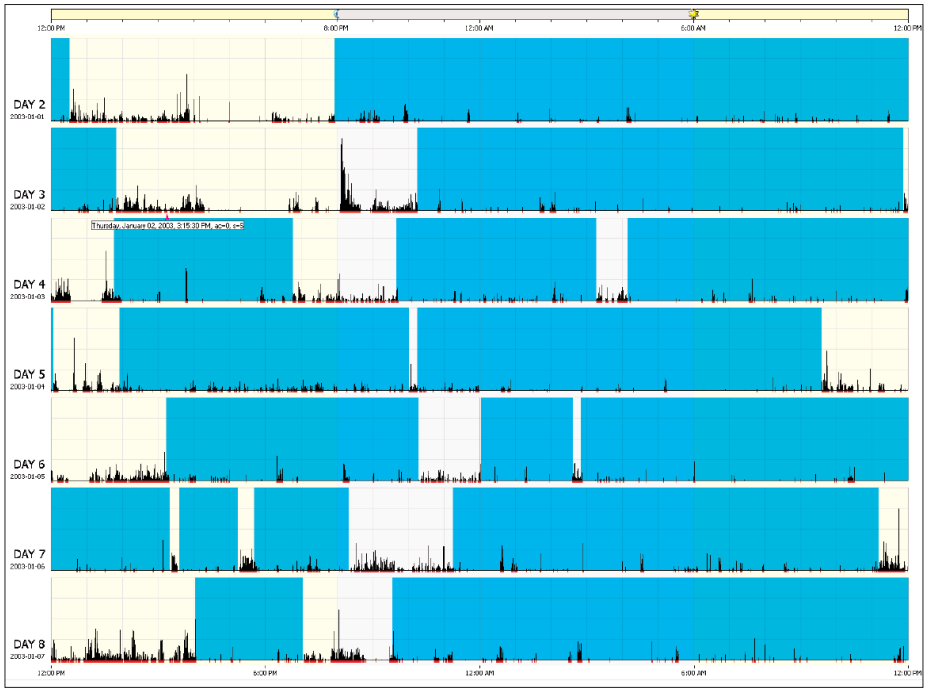
Circadian disorder – Non-24-hour or nonentrained type

Circadian disorder – irregular sleep wake

Most common in the elderly, especially those who are institutionalized

This type of disorder is typified by the absence of a well-defined pattern to the sleep/wake cycle and is often displayed by certain elderly populations. Multiple, major rest periods occur during the 24-hour day, and activity in general is depressed.

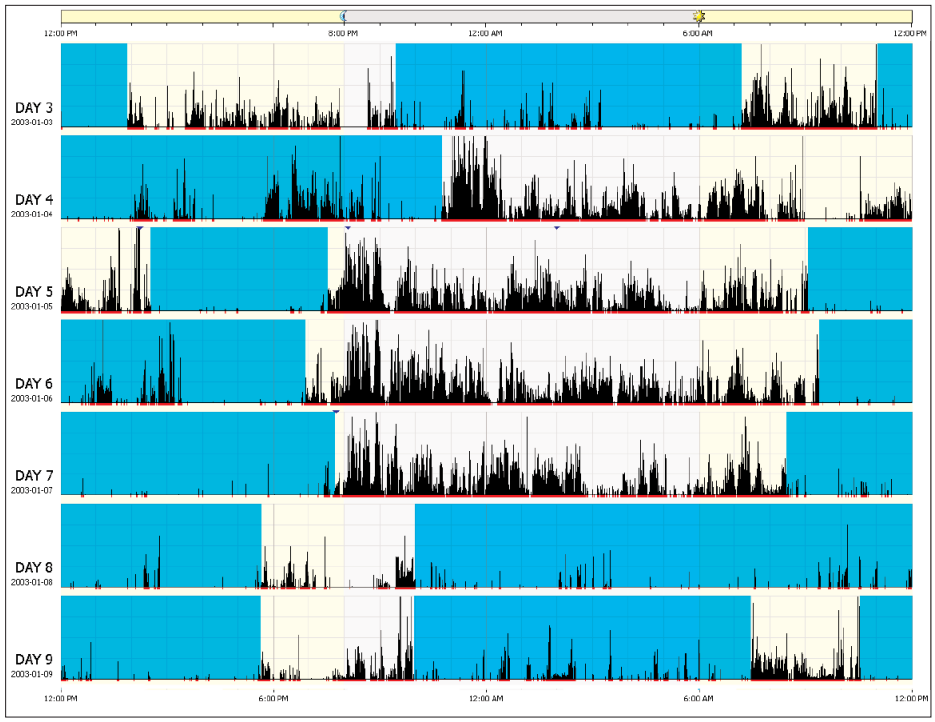
An actigraphy record of seven or more days can help identify patients with irregular sleep patterns for treatment with light, melatonin or increased social participation. It can also track changes in the patient's sleep/wake pattern once these treatments have been initiated.



Circadian disorder – irregular sleep wake

Shift work sleep disorder

Individuals required to alter their pattern of sleep/wake in order to work at jobs with variable hours can also be tracked using the Actiwatch device. It is easy to see not only the drastic changes in timing of the active periods, but also the fragmentation of consolidated sleep periods surrounding shift changes.



Shift work sleep disorder

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For more information about actigraphy and our Actiwatch devices, visit: www.actigraphy.com

CAUTION: US federal law restricts these devices to sale by or on the order of a physician.

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