

Foreword



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The next time you go to a symphony, splurge on a good seat—let's say center aisle, third row. Go alone (preferably). Get to your seat at least a quarter of an hour before it starts, close your eyes, and listen to the orchestra go about the business of tuning their instruments and getting ready. Such a cacophony of sounds—much akin to the noise one might find on a busy street corner! Suddenly there is a hushed silence except for the footsteps of the conductor walking to the podium and the audience rushing to their seats. A cough here and there. Then, the music begins: perhaps a few violins to your left initially, followed almost imperceptibly by the cellos on your right, and finally, impatiently, by woodwinds and brass directly in front of you, and the percussion way out in the distance, its sound enveloping the violins as it thunders toward you. Suddenly, the entire place is transformed from solitary musicians and their isolated instruments into a symphony.

Such, too, is the nature of polysomnography, a word derived from the Greek roots, *poly* (many), *somnus* (sleep), and *graphein* (to write). Akin to an orchestra, polysomnography is the vocabulary with which we convey the complex, but unified, process of sleep. Early on, a single profound observation influenced the development of polysomnography: that sleep, although a function of the brain, affects other physiologic processes as well. Therefore, it was established early on that polysomnography, rather than simply measuring brain electrical activity alone, should include electroencephalography, electrooculography, and electromyography. This was eventually

followed by the addition of respiratory sensors, oximetry, leg electromyogram, and other devices as technological advances allowed us to probe ever more comprehensively, and noninvasively, into the physiology as well as pathology of sleep.

It has been half a century since Nathaniel Kleitman, Eugene Aserinsky, and William Dement described rapid eye movement (REM) sleep, four decades after Allan Rechtschaffen and Anthony Kales standardized the method of scoring polysomnographic recordings in their classic paper, and two years since the American Academy of Sleep Medicine revised the sleep scoring guidelines. During this period, paper tracings had given way to the monitor screen and disc storage, and analog systems of recording sleep have been digitized and computerized.

The evolution of polysomnography continues even to this day. Recently, there has emerged a movement to simplify the process of monitoring sleep (ie, to measure only respiratory variables in persons suspected of having obstructive sleep apnea). We have, thus, both the capacity to expand the array of measuring devices during polysomnography, as well as increasingly more instruments that are more limited in scope—with avid proponents for each camp.

As musical compositions evolve into distinct styles, so too is polysomnography changing. Some patients and research subjects require the full components of the test and should get it; others may need only certain specific measures. The task that every clinician and researcher has to contend with is trying to distinguish the former

from the latter. No single technique is always the right one for every sleep disturbance and for every person. In 1907, Jean Sibelius and Gustav Mahler met for the first, and only, time in Helsinki. Both great composers by then, their conversation eventually turned to the topic of music. With characteristic austerity and economy that also marked his compositions, Sibelius stated that he writes, perhaps much like Beethoven, to capture a single concept. Mahler, Sibelius later recalled, had a different opinion, and said, “*Nein, die Symphonie muss sein wie die Welt. Sie muss alles umfassen.*” (“No, the symphony must be like the world; it must embrace everything.”) Whether, we prefer Mahler

or enjoy listening to Sibelius more, we have to agree that the two men are, implausible as it may seem, both correct, *but not always so*.

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