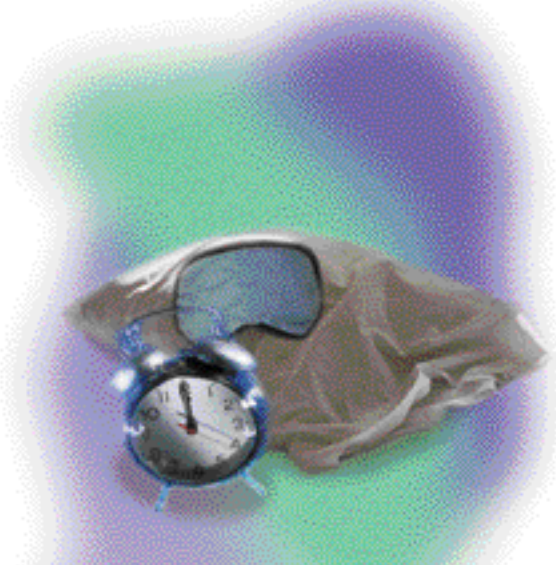


# Sleep Waves



## Has the Time Come for “Tele-Sleep”?

Until recently I had not given much thought, if any, to telemedicine applications in the role of health care and, in particular, sleep medicine. It is amazing what a year of research and exploration can do. I hope to share this experience and my conclusions regarding this emerging application for the sleep medicine community.

When I began this journey, my first question was “what is telemedicine?” We might hear about it, but there is still confusion as to what it is and how it is used. There are several terms that describe this type of health care offering: telehealth, e-health, and, of course, telemedicine.

The Institute of Medicine defines telemedicine as “the use of electronic information and communications technologies to provide and support health care when distance separates the participants.”<sup>1</sup> The “2001 Telemedicine Report to Congress” takes a broader approach and uses the term telehealth to encompass education as well: “The use of electronic information and telecommunications technologies to support long-distance clinical health care, patient and professional health related education, public health and health administration.”<sup>2</sup>

### Telemedicine: The government at work

The federal government has been active in the telemedicine arena for some time. The Joint Working Group on Telemedicine is a federal interagency group that was formed in 1995 and tasked with reporting to Congress on patient safety, efficacy, and quality of services provided along with other legal, medical, and economic

Service Networks (VISN) have established active telemedicine programs. A VISN provides for the “out of traditional care” typically administered by the VA. The Centers for Medicare and Medicaid Services (CMS) similarly supports research in some areas of telemedicine; and although CMS has recognized the need for telemedicine, it continues to be reluctant to reimburse.<sup>3</sup>

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issues. This report will aid the government in making decisions regarding telemedical care in the future.

The Department of Veterans Affairs (VA) and Department of Defense are also very active in telemedicine programs, from front-line medical care to continuing care at home. Currently, several Veterans Integrated

### Sleep telemedicine and clinical utility

One of the most critical issues facing the field of sleep medicine is accommodating the increasing numbers of the population in need of diagnosis and treatment. The landscape of the population is changing. By the year 2030, the population in the United States over the age of 65 will number one

## Telemedicine Resources

American Telemedicine Association (ATA)  
<http://www.atmeda.org/index.htm>

Office for the Advancement of Telemedicine (OAT)  
<http://telehealth.hrsa.gov/>

Telemedicine Information Exchange (TIE)  
<http://tie.telemed.org/>

Telemedicine Research Center (TRC)  
<http://trc.telemed.org/>

in five, some 70 million, which is double the number as of 2000.<sup>4</sup>

According to the National Institutes of Health, the prevalence of sleep disorders appears to increase

with advancing age. It is estimated that 80 million Americans will have a sleep problem by the year 2010. Furthermore, sleep disorders add an estimated \$15.9 billion

annually to the national health care bill.<sup>5</sup>

Data also indicate that the older population utilizes more medical services than younger adults do. A 1997 report from the Agency for Healthcare Research and Quality states that “people age 65 and older make up about 13 percent of the U.S. population, but account for 36 percent of the hospital admissions.”<sup>6</sup>

The Centers for Disease Control (CDC) reports the following regarding obesity. “In 1999, an estimated 61 percent of U.S. adults were either overweight or obese, defined as having a body mass index of 25 or more. In 2000, a total of 38.8 million American adults met the classification of obesity, defined as having a body mass index score of 30 or more.” Therefore, not only are we faced with an aging population, but an increasingly obese one as well. Both of these factors will continue to drive the field of sleep medicine, and the challenge will be the ability of sleep medicine professionals to meet the demand.

The reduction in Medicare payments and the restrictions posed on caregivers by managed care entities, together with the increasing body of knowledge that sleep-disordered breathing contributes to such co-morbidities as hypertension, cardiac disease, and diabetes, places an amplified professional burden on the practicing sleep physician.<sup>7-9</sup>

### The “match” of telemedicine and sleep

New communications tools and technological advances make it possible to gather data in the home or at remote locations in a cost-effective, timely, and accessible fashion. There are varying types of

## Terminology

**Store and Forward:** Historical data is stored in a device, then transmitted to a caregiver for use in the care of the patient

**Health Level 7 (HL7):** A standard for the exchange, management, and integration of data that support clinical patient care, and the management and delivery of health care services by defining the protocol for exchanging clinical data between diverse health care information systems

**Bluetooth:** A wireless application for short distance transmission, Blue-

Tooth communicates on a frequency of 2.45 gigahertz, which has been set aside by international agreement for the use of industrial, scientific, and medical devices (ISM)

**Wireless:** A method of transmitting data from one device to another or from a device to a computer

**Band Width:** How data is transferred via "air"

**Medical Telemetry:** Typically considered an in-hospital application, uses a specific bandwidth for data transmission

devices that deliver the data in different ways.

Telemedicine applications include "store and forward technologies" — video transmission of and remote monitoring of vital signs via real time. In the field of sleep medicine, we can foresee where such technology might be applicable in the population we serve.

Store and forward technology allows for less bandwidth requirements but still enables the caregiver to view historical information in a non-urgent manner. Video recording and data transfer can allow real-time data collection from a distance.

Technology has developed to allow the real-time transmission of sleep data to a sleep center via phone lines and modem. Smart media cards allow for store and forward capabilities; and now, wireless transmission of data from flow generators is possible.

### Searching for alternatives

The growing and changing population will provide ethical challenges to the sleep professional, and the shift

of technology to aid in our care and treatment of patients is continuing. The current state of sleep testing and follow-up will most likely not be sustainable for the long-term future; thus, alternatives to providing access to diagnosis and therapy must be found and validated. 🧠

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### EDITOR'S NOTE

In the next issue, "Sleep Waves" will continue the author's journey with a discussion on sleep disease management.

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