

ing the effect of various therapeutic modalities, such as medications, weight loss, continuous positive airway pressure, and surgery (uvulopalatopharyngoplasty), and follow-up studies should be controlled for position. Monitoring sleep position is also important in epidemiologic studies concerning OSA. The percentage of time spent sleeping on the back varies in a given patient from night to night and might range from 0% to 100%. The most severe OSA occurs in the majority of patients when they sleep *all night on their backs*. When performing polysomnography, we want to find out how severe the sleep apnea can become and preferably study our patients while they are sleeping only on their backs. However, since this is not always

possible, we feel that polysomnographic studies for OSA should be performed while the patients spend at least 50% of their total sleep time in the back position. It would be beneficial to calculate separately the back apnea index (total number of apneic episodes on the back, divided by total back sleep time in hours): in most cases, this index is higher and gives a better estimation of the possible severity of the OSA syndrome. The variability between different night studies in a given patient regarding other aspects of sleep has been reported as well<sup>10</sup> and should perhaps necessitate the performance of two separate night studies in each patient, even if an adequate percentage of sleep time is spent on the back during a single study.

#### REFERENCES

1. Cartwright RD. Effects of sleep position on sleep apnea severity. *Sleep* 1984; 7(2):110-114.
2. Kavey NB, Blitzer A, Gidro-Frank S, Korstanje K. Sleeping position and sleep apnea syndrome. *Am J Otol* 1985; 6(5):373-377.
3. Phillips BA, Oreson J, Paesani D, Gilmore R. Effects of sleep position on sleep apnea and parafunctional activity. *Chest* 1986; 90(2):424-429.
4. Lerner SA, Cecil WT. The effect of sleeping posture on obstructive sleep apnea. *Chest* 1984; 86(2):327.
5. Cartwright RD, Lloyd S, Lilie J, Krantz H. Sleep position training as treatment for sleep apnea syndrome: a preliminary study. *Sleep* 1985; 8(2):87-94.
6. Chandhary BA, Chandhary TK, Kolbeck RC, Harmon JD, Sepir WA. Therapeutic effects of posture in sleep apnea. *South Med J* 1986; 79(9):1061-1063.
7. Jackson E, Schmidt H. Modification of sleeping position in the treatment of obstructive sleep apnea. In: *Sleep Research. Volume II*. Los Angeles: Brain Information Service/Brain Research Institution, University of California, 1982.
8. Edwards CR, Burgess RC, Perry MC, Dinner DS, Lüders HO. Development of a position transduction system for continuous polygraphic display. *Sleep* 1988; 17:333.
9. Coleman RM, Roffwarg HP, Kennedy SJ, et al. Sleep-wake disorders based on a polysomnographic diagnosis. *JAMA* 1982; 247(7):997-1003.
10. Wittig R, Romaker A, Zorick F, Roehrg T, Conway W, Roth T. Night to night consistency of apneas during sleep. *Am Rev Respir Dis* 1984; 129:224-226.

### Commentary

**S**leep apnea syndrome (SAS) exists as a primary cause of daytime sleepiness. The past decade has seen a logarithmic increase in the number of studies on sleep apnea with a concomitant increase in awareness of SAS by the practicing physician. Several studies suggest SAS is associated with increased morbidity and mortality in addition to its adverse impact on social relationships and the activities of daily living. He and colleagues (*Chest* 1988; 94:9) reported a significantly higher mortality rate in untreated sleep apnea patients with an apnea index greater than 20 as compared with those with an index less than 20. The probability of cumulative 8-year survival was  $.96 \pm 0.02$  in the group with an apnea index less than 20 as compared with  $.63 \pm .17$  for those with an index greater than 20. The difference was most pronounced in those under age 50. The availability of an effective viable treatment option (nasal continuous positive airway pressure) for a potentially fatal disease increases the

importance of a reliable diagnostic test.

Overnight polysomnography is the preferred diagnostic modality. However, the negative predictive value of this test is unknown. Previous authors have reported a significant night-to-night variability in apnea index, particularly in those with milder forms of the syndrome (Wittig et al. *Amer Rev Resp Dis* 1984; 129:224). Katz and Dinner underscore the importance of body position as an additional variable. Failure of the patient to sleep on his back may result in a false-negative test. They argue persuasively for inclusion of position monitoring in routine clinical polysomnography. In the absence of position monitoring, a repeat study should be considered if the clinical suspicion of SAS remains high and the initial study is negative.

DAVID P. MEEKER, MD  
Department of Pulmonary Disease  
The Cleveland Clinic Foundation