



Evidence that Home Apnea Testing does not Follow AASM Practice Guidelines or Bayes' Theorem

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As someone who has lost sleep over various practical and philosophical questions regarding the use, and misuse, of home sleep testing (HST), I was eager to read about the results of a large data sample of the ARES diagnostic system.¹ The goal of the study was to address one key concern in the field: is HST being used appropriately. The results show that 90% of the cohort was considered high risk of OSA by a self-reported pre-screen, and 80% of those turned out to have OSA—defined by an ARES test with AHI > 5.

The conclusion that HST was in fact used in patients with a high probability of OSA seems straightforward and reassuring. However, even if we put aside the 10% to 20% with symptoms or medical problems that are potential contraindications to HST, and instead focus on the HST data itself, a different interpretation arises.

The AASM guideline states, among several requirements, that HST should be limited to patients with high pre-test probability of at least moderate OSA, defined as AHI > 15,² which is confirmed in the UpToDate entry authored by Dr. Collop. Using this definition of OSA, only about 42% met criteria after testing, necessitating that the pre-test probability was much lower. In fact, Bayes' theorem says the pre-test probability of AHI > 15 is actually less than 5%.

Perhaps the authors were drawn to the AASM technology review,³ which used AHI > 5 to define OSA in their explanation of the 80% pre-test requirement, or to the observation that HST devices tend to under-estimate the AHI? Here still we would not meet the high pre-test probability requirement: to achieve the observed 80% post-ARES prevalence of AHI > 5, Bayes' theorem tells us that the pre-test probability would be 50%, based on the ARES sensitivity and specificity.

Thus, we are faced with a challenge: To be reassured by this data requires that we disregard both the AASM definition of "high" pre-test probability, and the AASM definition of moderate OSA. Although the field might benefit from discussions

of these two issues, they are not even mentioned in a paper concluding that HST, or at least the ARES system, is being used appropriately. If we are to make progress in addressing the optimal use and regulation of HST in sleep medicine, we must ensure at a minimum that we are on the same page when interpreting results from important data such as these. This is particularly critical when changing the definitions of AHI threshold and pre-test probability can switch the conclusion from reassurance of appropriateness to objective evidence over-use.

CITATION

Bianchi MT. Evidence that home apnea testing does not follow AASM practice guidelines or Bayes' theorem. *J Clin Sleep Med* 2015;11(2):189.

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DISCLOSURE STATEMENT

Dr. Bianchi is co-inventor on pending patent related to home sleep monitoring, has a consulting agreement with Sunovion, is on the clinical advisory board of Foramis, Inc, and has received travel funding from Servier.