

# Misclassification of OSA Severity With Automated Scoring of Home Sleep Recordings

*R. Nisha Aurora, MD; Rachel Swartz, BA; and Naresh M. Punjabi, MD, PhD, FCCP*

**BACKGROUND:** The advent of home sleep testing has allowed for the development of an ambulatory care model for OSA that most health-care providers can easily deploy. Although automated algorithms that accompany home sleep monitors can identify and classify disordered breathing events, it is unclear whether manual scoring followed by expert review of home sleep recordings is of any value. Thus, this study examined the agreement between automated and manual scoring of home sleep recordings.

**METHODS:** Two type 3 monitors (ApneaLink Plus [ResMed] and Embletta [Embla Systems]) were examined in distinct study samples. Data from manual and automated scoring were available for 200 subjects. Two thresholds for oxygen desaturation ( $\geq 3\%$  and  $\geq 4\%$ ) were used to define disordered breathing events. Agreement between manual and automated scoring was examined using Pearson correlation coefficients and Bland-Altman analyses.

**RESULTS:** Automated scoring consistently underscored disordered breathing events compared with manual scoring for both sleep monitors irrespective of whether a  $\geq 3\%$  or  $\geq 4\%$  oxygen desaturation threshold was used to define the apnea-hypopnea index (AHI). For the ApneaLink Plus monitor, Bland-Altman analyses revealed an average AHI difference between manual and automated scoring of 6.1 (95% CI, 4.9-7.3) and 4.6 (95% CI, 3.5-5.6) events/h for the  $\geq 3\%$  and  $\geq 4\%$  oxygen desaturation thresholds, respectively. Similarly for the Embletta monitor, the average difference between manual and automated scoring was 5.3 (95% CI, 3.2-7.3) and 8.4 (95% CI, 7.2-9.6) events/h, respectively.

**CONCLUSIONS:** Although agreement between automated and manual scoring of home sleep recordings varies based on the device used, modest agreement was observed between the two approaches. However, manual review of home sleep test recordings can decrease the misclassification of OSA severity, particularly for those with mild disease.

**TRIAL REGISTRY:** ClinicalTrials.gov; No.: NCT01503164; [www.clinicaltrials.gov](http://www.clinicaltrials.gov)

CHEST 2015; 147(3):719-727