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Title: Effectiveness of sequential automatic-manual home respiratory polygraphy scoring

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Body: Introduction: Automatic home respiratory polygraphy (HRP) scoring functions can potentially confirm the diagnosis of sleep apnea-hypopnea syndrome (SAHS) (obviating technician scoring) in a substantial number of patients. The result would have important management and cost implications. Objectives: To determine the diagnostic cost-effectiveness of a sequential HRP scoring protocol (automatic and then manual for residual cases) as compared to manual HRP scoring, both with in-hospital polysomnography. Methods: We included suspected SAHS patients in a multicentric study and assigned to home and hospital protocols at random. We constructed Receiver Operating Characteristic (ROC) curves for manual and automatic scorings. Diagnostic agreement for several cut-off points was explored and costs for two equally effective alternatives were calculated. Results: Of 366 randomized patients, 348 completed the protocol. Manual scoring produced better ROC curves than automatic scoring. There was no sensitive automatic or subsequent manual HRP apnea-hypopnea index (AHI) cut-off point. The specific cut-off points for automatic and subsequent manual HRP scorings (AHI>10 in both) had a specificity of 88% and 97%, respectively. The costs of manual and sequential HRP protocols were similar but less than the half that of polysomnography. Conclusion: A sequential HRP scoring protocol is a cost-effective alternative to polysomnography, although with a marginal cost savings compared to HRP manual scoring.