

# Comparison of the Fitbit® and polysomnography for measuring sleep quality after adenotonsillectomy in children

Mohammed Hakim MBBS, Dmitry Tumin PhD, Kris Jatana MD, Joseph D. Tobias MD, Vidya T Raman MD

Department of Anesthesiology & Pain Medicine & Department of Otorhinolaryngology  
Nationwide Children's Hospital and The Ohio State University, Columbus, Ohio.

## Background

- Sleep-disordered breathing (SDB) often persists after tonsillectomy.
- PSG is the gold standard for the diagnosis of SDB and obstructive sleep apnea (OSA), but entails significant time and cost commitment.
- The current study compares Fitbit® Charge to PSG data on sleep quality among children with persistent SDB after tonsillectomy.
- The primary objective was to determine if Fitbit® systematically over- or under-estimates total sleep time (TST).
- The secondary objective was to characterize concordance between Fitbit® and PSG measures of sleep quality.



## Methods

- After IRB approval, children 3-18 years of age undergoing PSG after adenotonsillectomy were enrolled.
- The Fitbit® Charge was placed and time-synchronized with sleep laboratory devices that were worn during overnight PSG.
- TST, total wake time (TWT), and number of awakenings were obtained via Fitbit and PSG.
- Paired t-tests were used to evaluate over- or under-estimation of sleep quality measures on Fitbit® as compared to PSG.
- Lin's concordance coefficient was used to test for concordance of measures between devices.



## Results

- The study cohort included 9 patients who had undergone adenotonsillectomy to treat OSA.
- On PSG, 2 of the 9 patients met the apnea-hypopnea index cutoff for OSA.
- TST was  $393 \pm 35$  minutes on PSG and  $400 \pm 34$  minutes on Fitbit® Charge, with no statistically significant difference between the two measurements. ( $p=0.365$ )
- TWT was  $50 \pm 25$  minutes by PSG and  $44 \pm 18$  minutes by Fitbit®
- Concordance between PSG and Fitbit® was statistically significant for TST ( $p < 0.001$ ), whereas it failed to reach statistical significance for TWT and number of awakenings.

## Conclusion

- Our data suggests that the Fitbit® offers a cost-effective option for monitoring sleep quality, especially TST, in patients with ongoing OSA/SDB symptoms after adenotonsillectomy.

## References:

1. Pediatrics 2002;109(4):e69-e69.
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