

Supplementary Figures

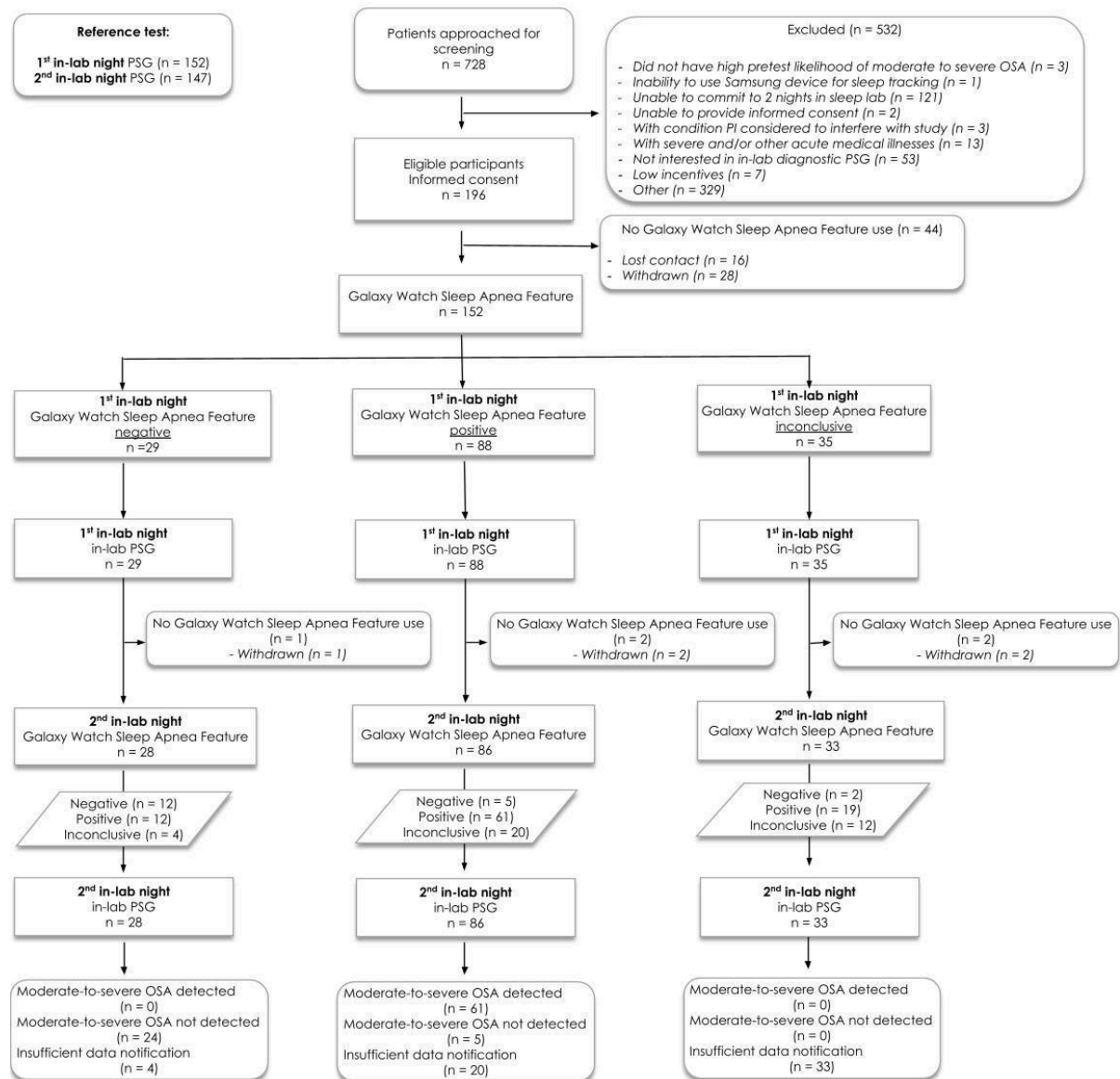


Fig S1. Diagram illustrating participant enrollment, exclusions, and inclusion in the final analyses according to STARD guidelines. The Galaxy Watch Sleep Apnea Feature served as the index test, and in-lab PSG served as the reference standard. The diagram details participant flow from screening through PSG completion, availability of valid watch-derived eAHI, and final analytic cohorts.

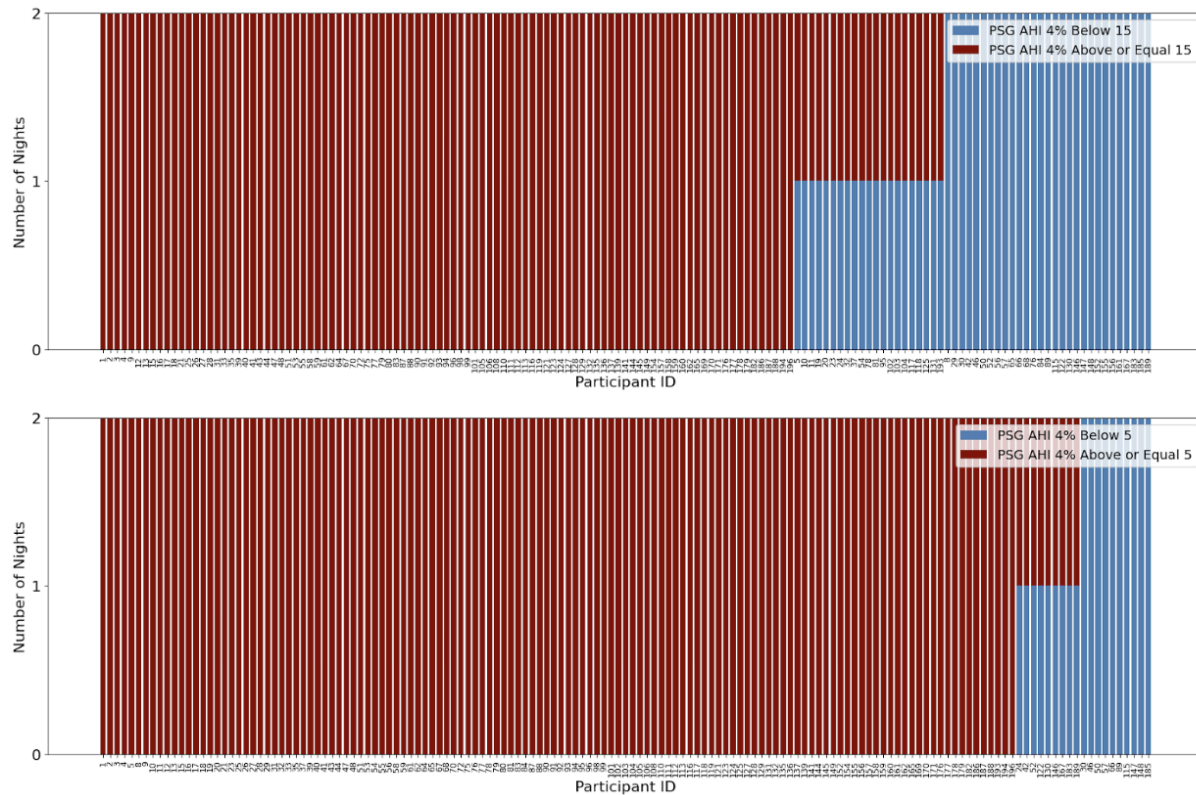


Fig S2. Participant classification across nights at AHI thresholds of 5 and 15. Night-to-night consistency of participant classification relative to AHI 4% thresholds of 5 and 15 events/h. For each threshold, the plot shows the number of participants with both nights below the threshold, one night below and one night above, or both nights above the threshold, providing a visualization of reclassification patterns across in-lab nights. 66% and 87% of participants had AHI 4% values above 15 and 5 events/h, respectively, on both nights.

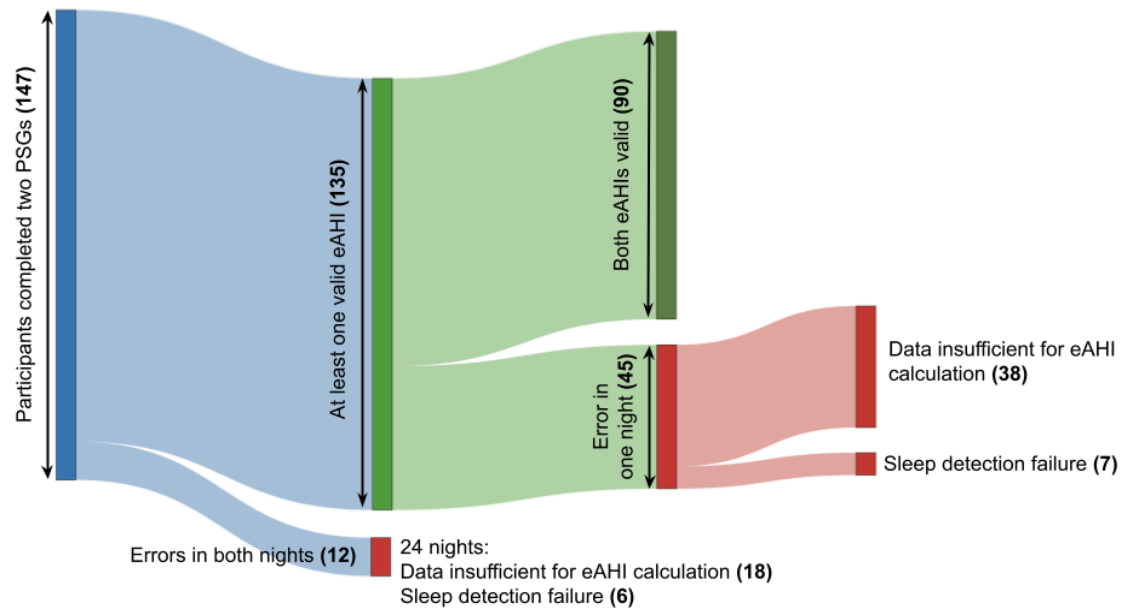


Fig S3. Galaxy Watch data flow and data quality across in-lab nights. Sankey diagram illustrating the progression of Galaxy Watch recordings from all completed participants through data-quality assessment. Of the 147 participants, 135 contributed at least one valid Galaxy Watch eAHI, and 90 achieved two valid nights. The remaining participants were classified into specific data-quality error categories, including insufficient data for eAHI calculation and sleep detection failure.

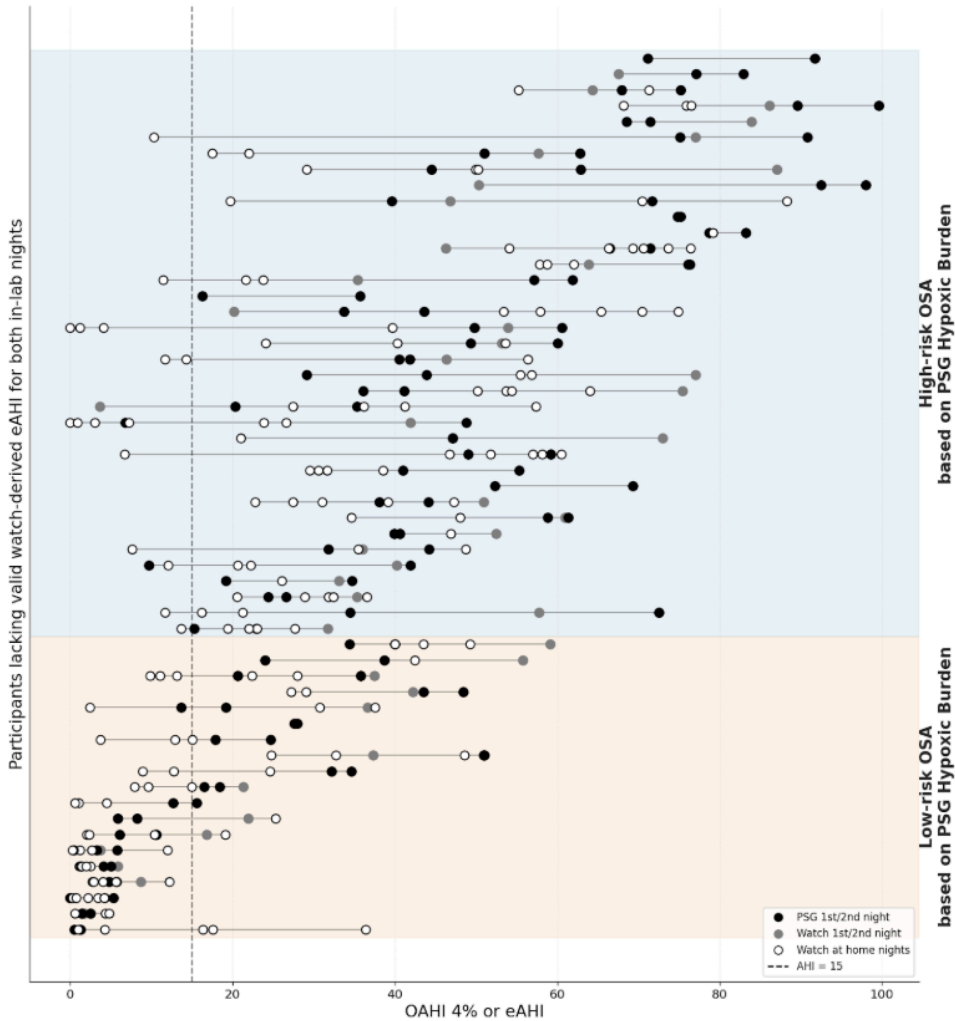


Fig S4. Integration of at-home tests for participants missing in lab eAHI values due to data errors. Participants with one or two PSG nights lacking valid Galaxy Watch eAHI values—due to factors such as limited SpO₂ coverage, device battery depletion, or insufficient sleep duration—totaling 57 cases, were supplemented with corresponding at-home recordings. Participants are stratified by HB-defined risk, with low-risk OSA group shown in the lower panel and high-risk OSA in the upper panel. Among the majority of high-risk cases, participants with positive PSG-derived OAHl 4% also demonstrated positive at-home eAHI results, indicating strong concordance. Conversely, in the low-risk group, where most participants had negative PSG-derived OAHl 4%, at-home eAHI values likewise remained negative. Across both risk

groups, at-home eAHI measurements exhibited a clear and directionally consistent trend relative to PSG-derived AHI-based and HB-based strata. Notably, a small number of outliers showed lower at-home eAHI values, potentially reflecting the use of CPAP or other sleep-related interventions during those nights.

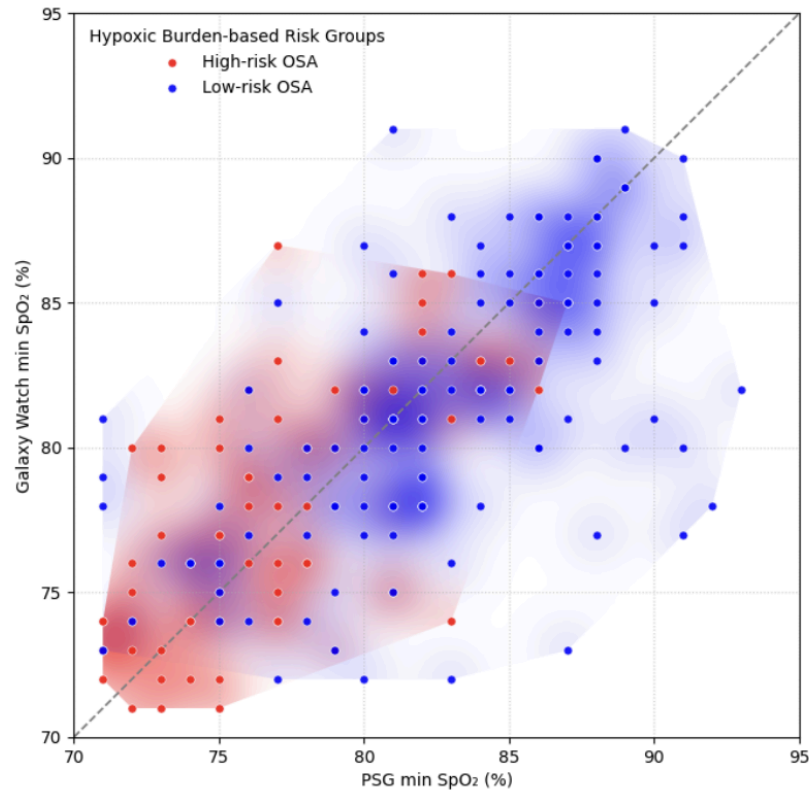


Fig S5. Comparison of minimum SpO₂ between Galaxy Watch and PSG. Scatter plot comparing watch-derived and PSG-derived minimum SpO₂ values across all participants for whom the watch successfully detected sleep and generated valid eAHI. Each point represents one in-lab night. Participants are colored and clustered by HB-based risk group (high-risk OSA vs. low-risk OSA). Shaded regions represent smoothed point density within each risk group, clipped to the convex hull of the observed data to highlight clustering patterns. The dashed line indicates the line of identity ($y = x$). Minimum SpO₂, a marker of nocturnal hypoxemia, shows strong agreement between Galaxy Watch and PSG measurements, with lower values observed among high-risk OSA participants.

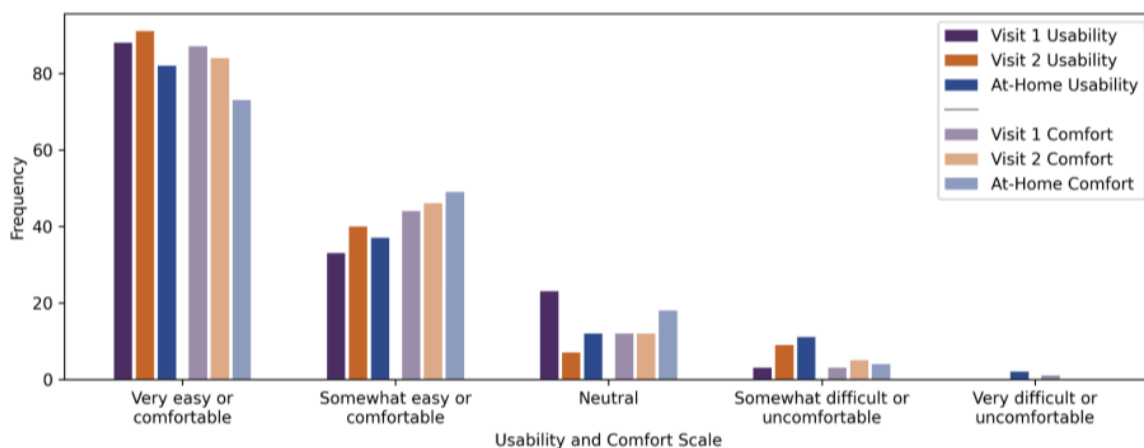


Fig S6. Watch usability and comfort. The plot summarizes participant-reported ratings of usability and comfort for the Galaxy Watch during both in-lab and at-home sleep nights. The majority of participants rated the device as “very easy” or “somewhat easy” to use and as “very comfortable” or “somewhat comfortable” to wear during sleep, indicating high acceptability in both in-lab (87.2%) and free-living (83.7%) environments. Usability and comfort were assessed using the questions: “How easy was it to use the smartwatch?” and “How comfortable was it for you to wear the smartwatch during sleep?”, respectively.