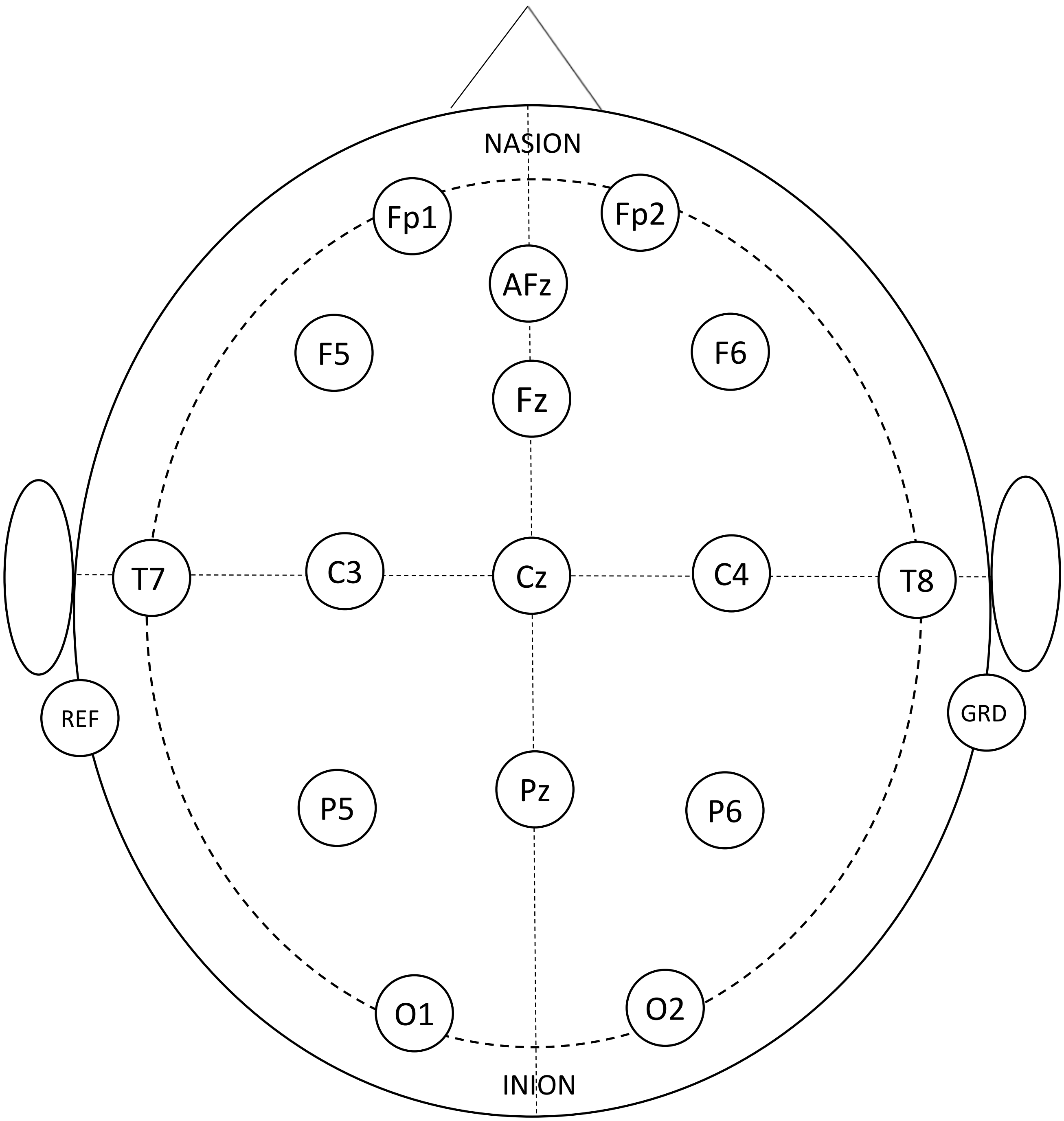
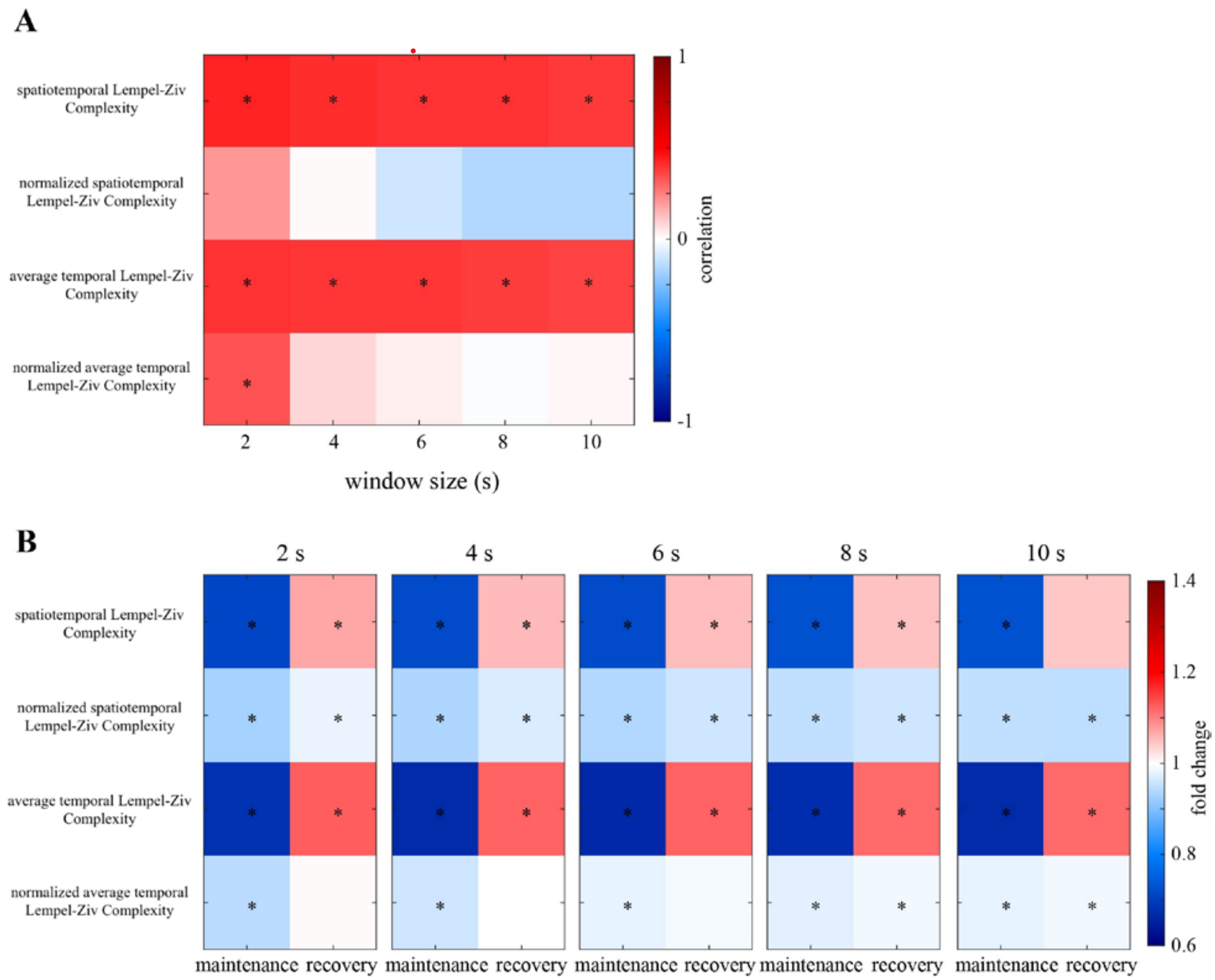
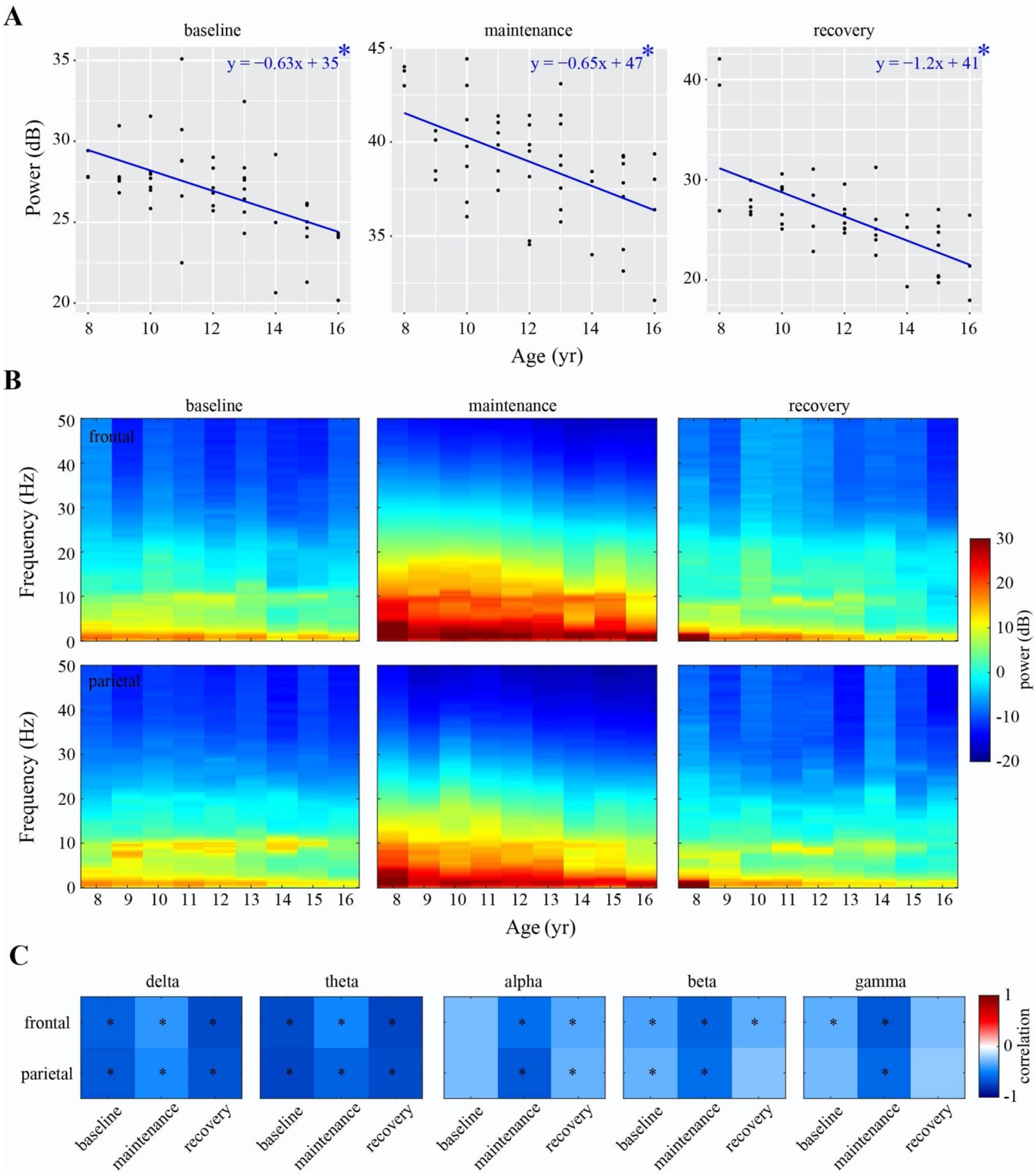
Supplemental Digital Content:



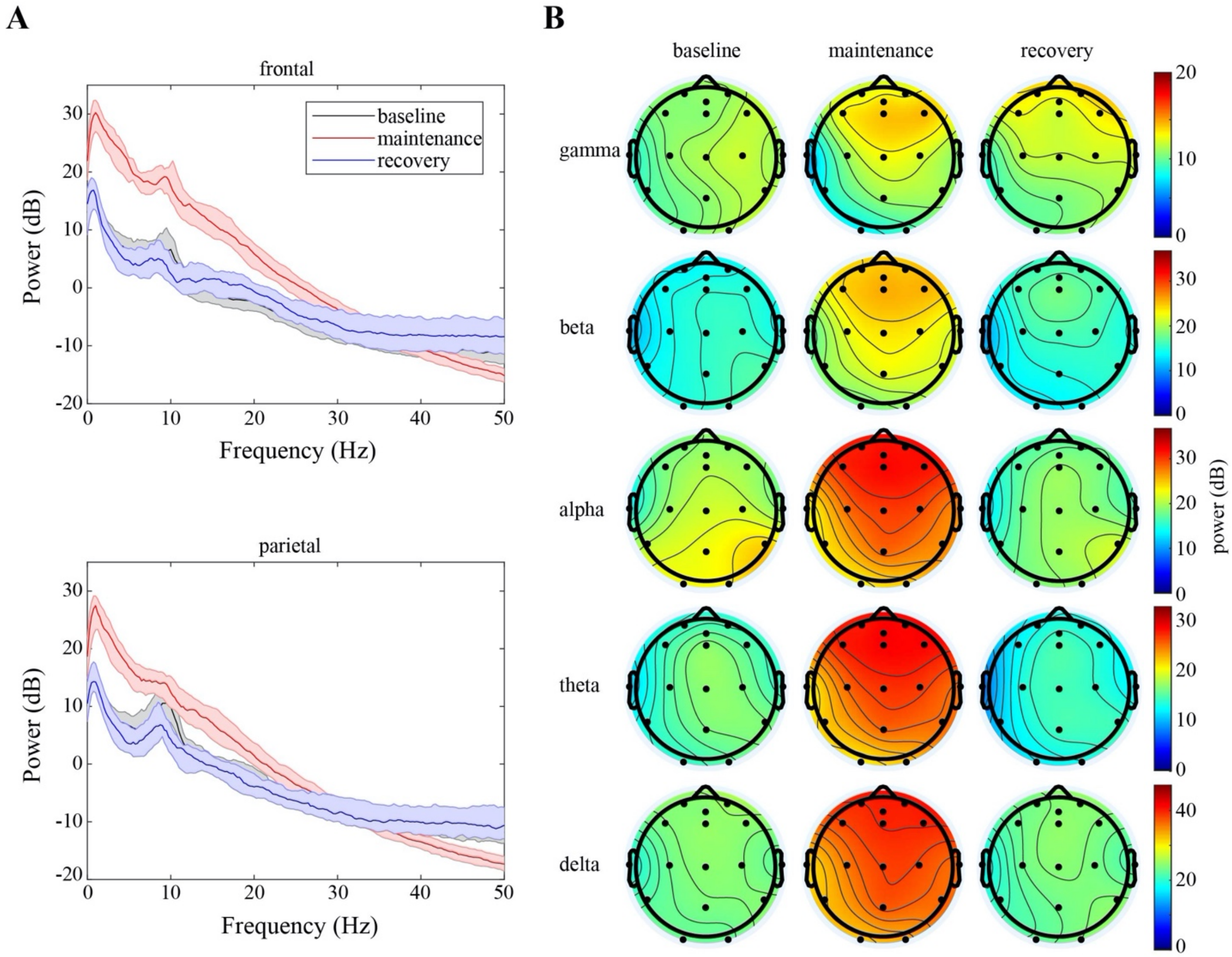
Supplemental Figure 1. 16-Channel Electroencephalogram Montage - International 10-20 System. REF = reference, GRD = ground.



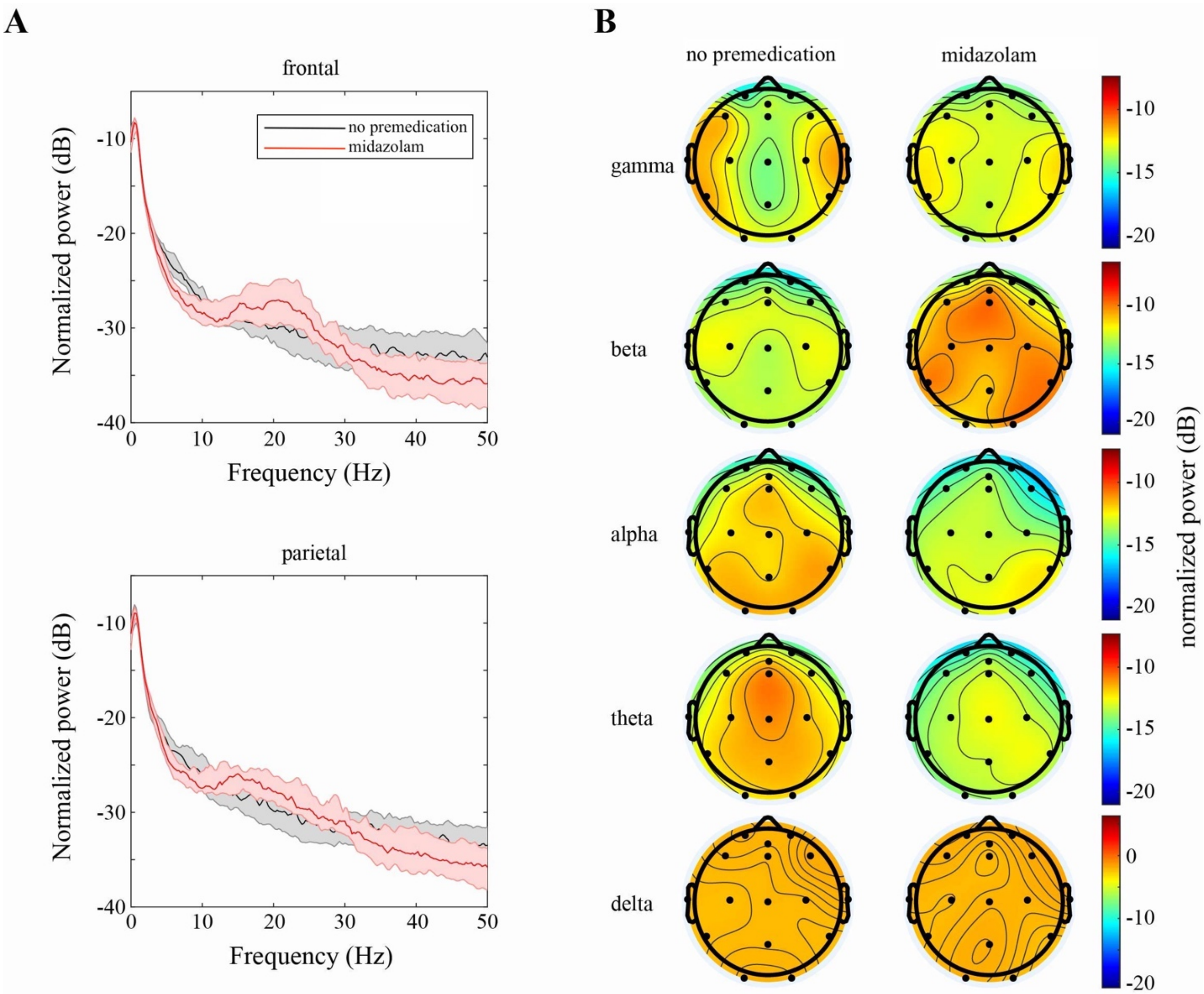
Supplemental Figure 2. Robustness testing of complexity data by varying the analysis window duration. (A) Spearman correlation between age and complexity values during the eyes-closed baseline period. (*denotes significant correlation with uncorrected $p<0.05$) (B) The fold change of the median value of the complexity (to baseline) in maintenance and recovery periods across subjects (Wilcoxon signed rank test, *denotes significant difference with Bonferroni correction $p<0.017$ for 3 pairs comparison). s = seconds



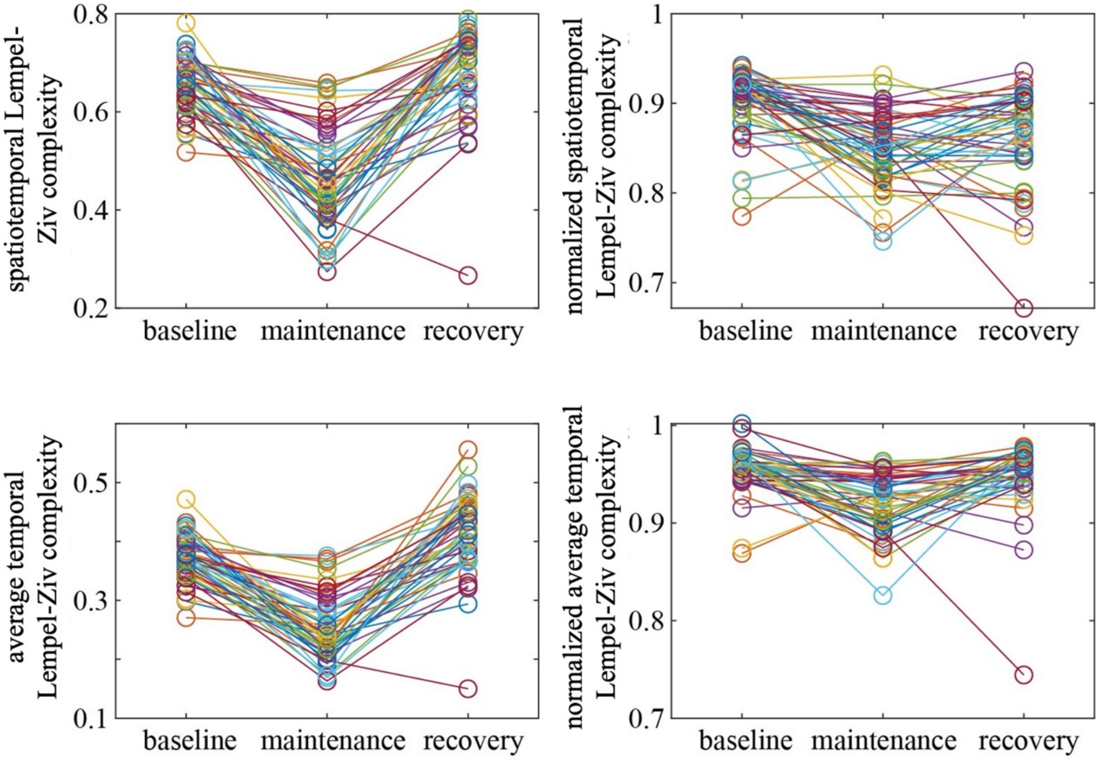
Supplemental Figure 3. Effects of age on electroencephalogram power. (A) Total electroencephalogram power as a function of age for the baseline, maintenance, and recovery periods. The data from individual subjects (black dots) were transformed to a log scale and linear regression was performed (blue line; *denotes significance $p<0.01$). (B) Power spectral properties from the frontal and parietal brain regions for the baseline, maintenance, and recovery periods. (C) Spearman correlation between age and electroencephalogram power in the frontal and parietal brain regions for each frequency band across the baseline, maintenance, and recovery periods (*denotes significant correlation with uncorrected $p<0.05$). Hz = Hertz, dB = decibel, yr = year



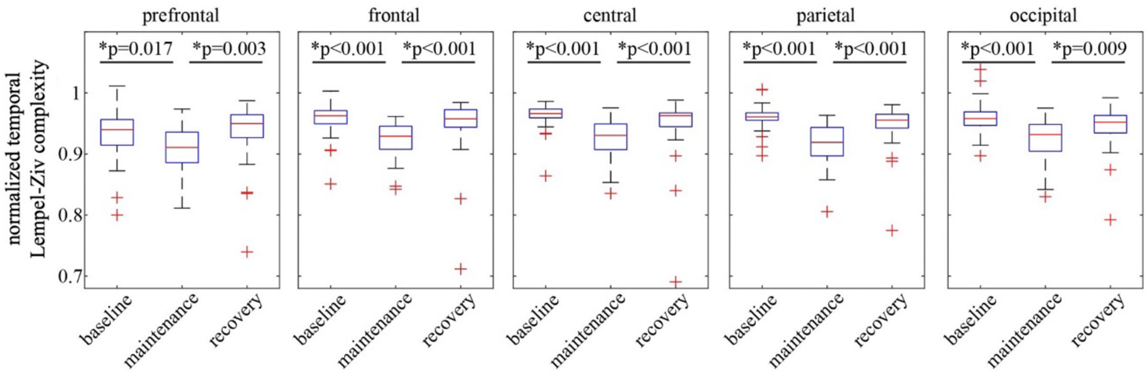
Supplemental Figure 4. Group level changes in spectral properties of electroencephalogram total power. (A) Total power in the frontal and parietal brain regions plotted as a function of frequency for the baseline, maintenance, and recovery periods (central dark line represents the median value with shading representing the interquartile range). (B) Topographical plots of electroencephalogram power in each frequency band for the baseline, maintenance, and recovery periods (note different power scale for each frequency band). Hz = Hertz, dB = decibel



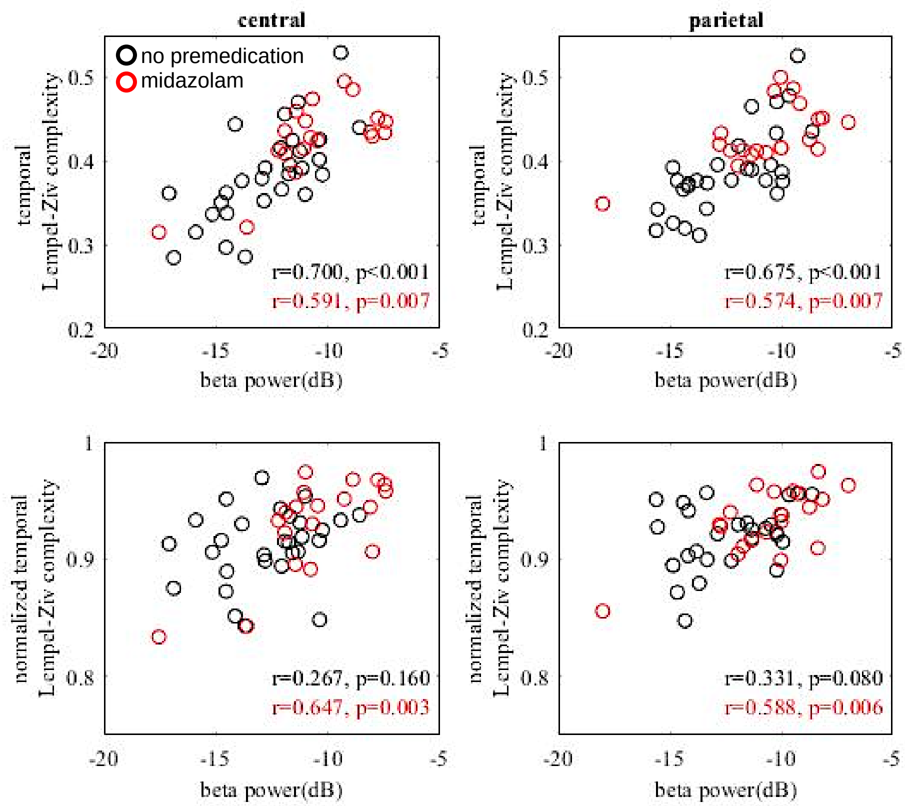
Supplemental Figure 5. The effects of midazolam premedication on electroencephalogram normalized power prior to the first intraoperative anesthetic medication administration. (A) Normalized power in the frontal and parietal brain regions as a function of frequency for subjects that received (red line) and those who did not receive (black line) intravenous or oral premedication with midazolam (solid line represents median value with shading representing the interquartile range). (B) Topographical electroencephalogram data presented for each frequency band. (note variations in the normalized power scale bar), Hz = Hertz, dB = decibel



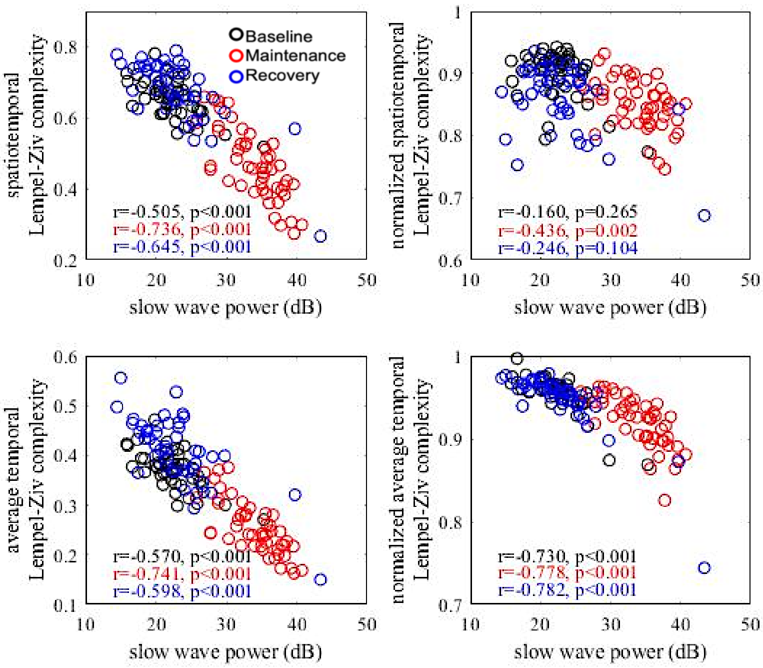
Supplemental Figure 6. Effects of general anesthesia on cortical complexity. Individual level data are shown for each complexity measurement across the baseline, maintenance, and recovery periods. Each open circle and connected line represent the change across electroencephalogram analysis period for an individual subject.



Supplemental Figure 7. Region-wise analysis of normalized temporal Lempel-Ziv complexity across the baseline, maintenance, and recovery periods. *denotes significance (p value shown); Wilcoxon signed rank test with Bonferroni correction for 3 pairwise comparisons.



Supplemental Figure 8. Association of temporal Lempel-Ziv complexity measures and beta power during the premedication epoch in the central and parietal brain regions for midazolam (red) and no premedication (black) groups. Spearman correlation coefficients and p values are shown above. dB = decibel



Supplemental Figure 9. Association of Lempel-Ziv complexity measures and slow wave (< 1.5 Hertz) power during the baseline (black), maintenance (red), and recovery (blue) epochs. Spearman correlation coefficients and p values are shown above. dB = decibel