Supporting Information

SI Methods.

Analysis of heart rate decay. Cardiac interbeat intervals were obtained by using a QRS wave detector based on amplitude and first derivative of ECG waveform and verified by a trained technician to ensure that only "normal-to-normal" R waves times were included. Beat-to-beat heart rate calculated from the R–R intervals and visually scanned to exclude spurious recordings. The resultant heart rate vs. time data were modeled with the "nls" function provided in R [1] (version 3.5.3) to fit the following equation:

$$HR_t = HR_o + (HR_{ES} - HR_0)e^{(-t/T_{300})}$$

in which

t = time since exercise recovery (sec)

HR_t = heart rate at t

HR_0 = resting(final) heart rate (t=∞)

HR_{ES} = maximum heart rate during exercise

T_{300}= time constant of the heart rate responses in the first 300 sec

References

1. *R: A language and environment for statistical computing* [computer program]. Vienna, Austria: R Foundation for Statistical Computing; 2019.

Supplementary figures.

Figure. S1. Examples of (**A**) systolic BP recovery rate and (**B**) an exponential decay curve fit to 5 min of heart rate recovery for a single participant following the exercise test.

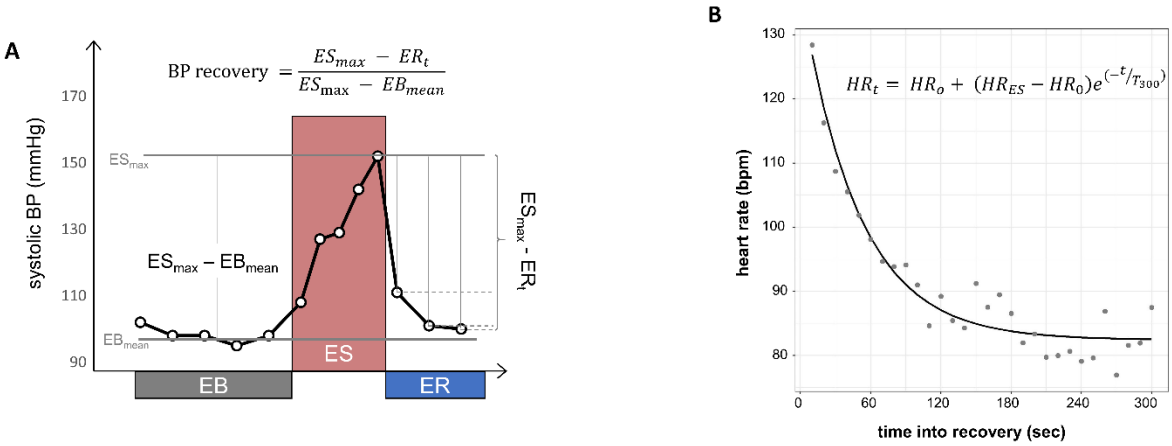

Figure. S2. Double plots of averaged absolute values of systolic BP (left), diastolic BP (middle), and HR (right) at baseline (EB), peak exercise (ES), and recovery period (ER) across circadian phases. Black circles, baseline; red circles, exercise; for systolic BP and diastolic BP, light, medium, dark blue circles, 1-min, 6-min, and 11-min into ER, respectively; for HR, light, medium blue circles, 1-min, 2-min into ER, respectively; error bars, SEM; gray bars, group average habitual sleep episodes.

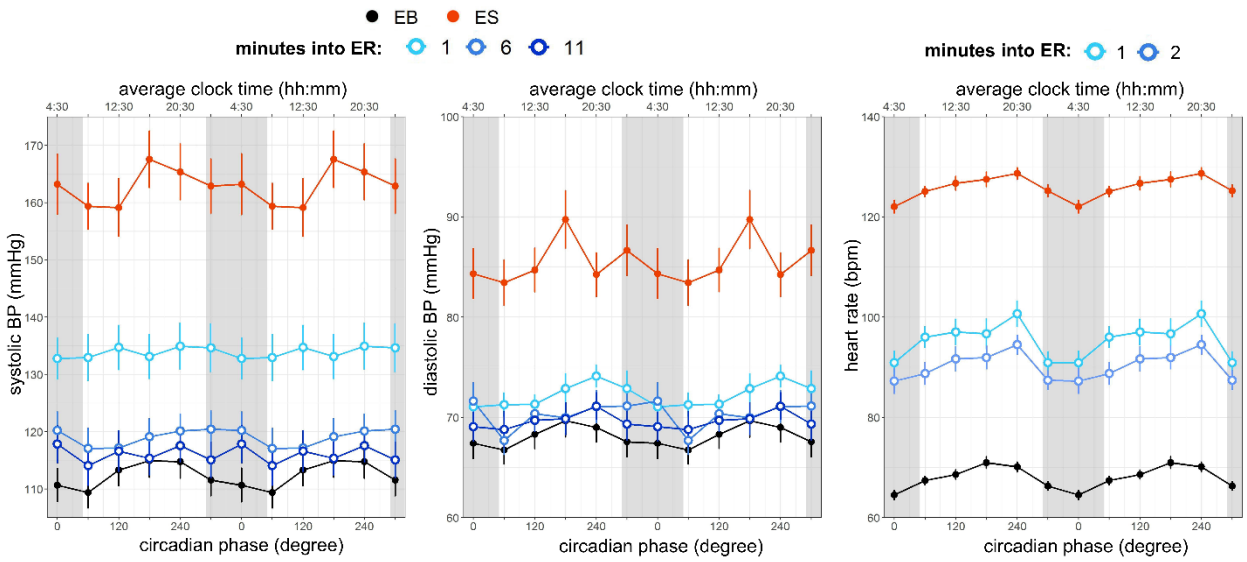

Figure. S3. Diastolic BP recovery after exercise across circadian cycles. Diastolic BP recovery rates are expressed in the same way that systolic BP recovery rates are in Figure 2, as a proportional recovery **(A, C)** or as a difference **(B, D)**. Light, medium, dark blue circles, 1-min, 6-min, and 11-min into ER, respectively; error bars, SEM; gray bars, group average habitual sleep episodes; horizontal dotted lines, baseline. **(C, D)** shown are the cosinor fits to the diastolic BP recovery indices. Each model reflects the summed MESOR, fundamental, harmonic components, and averaged time since recovery effects. Cosinor analyses were performed on the 360° data sets, whereas data are double plotted (two identical circadian cycles) to aid visualization of rhythmicity. Lines, model fit; error bars, SEM. P values, significance of circadian effect from cosinor analyses.