Supplementary Methods

Radiotelemetric blood pressure data processing

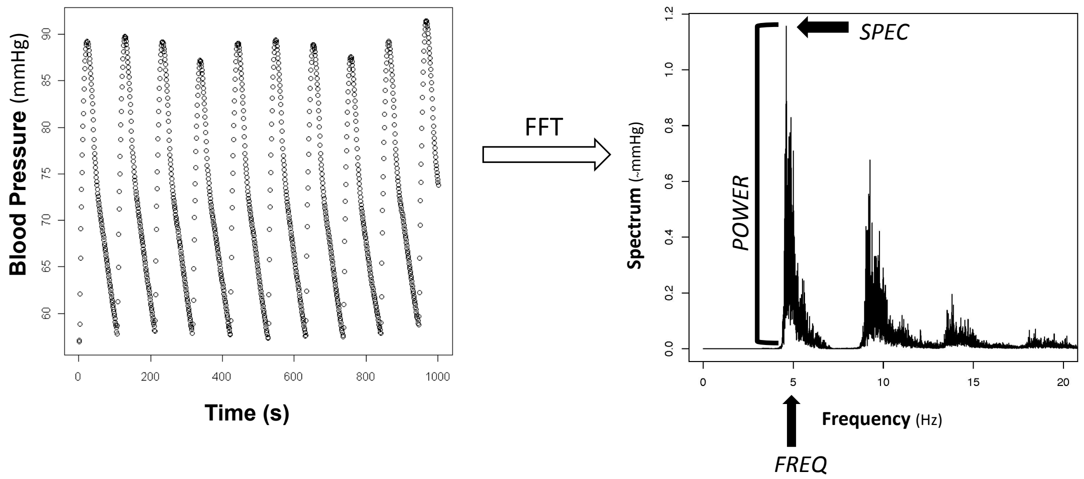
Blood pressure values that were outside the range of calibration for the transducers (0 mmHg - 300 mmHg) were removed from each series. We used a window of seven measurements across the time series to derive the sequence of minimum and maximum peak values. Each sequence was used to calculate the mean and standard deviation of the minimum and maximum peaks. Measurements lying outside three standard deviations from the mean minimum (or maximum) peak were treated as outliers and removed.

Spectral analysis

The spectral analysis was performed in the Matlab computer program environment, using a periodogram[1-3]. Let

$$S(e^{j\omega}) = \frac{1}{2\pi} \frac{\left| \sum_{n=1}^{N} x_n w_n e^{-j\omega} \right|^2}{\|w\|^2} \quad (1)$$

be the spectral power density of the with units of power per radians per sample, where $x_1 \ldots x_N$ is the thinned lagged time series, with $w_1 \ldots w_N$ is the Hamming window and $-j\omega$ is the frequency in radians per sample. We identified the highest peak in $S(e^{j\omega})$ is the spectral power density of the original sequence and has units of power per radians per sample. We identified the highest peak in $S(e^{j\omega})$, with respect to frequency, and defined SPEC to be the height of that peak and FREQ to be the frequency at which the peak occurs. Finally, POWER is the average power calculated by integrating over the 95% confidence interval surrounding the peak. See figure below for an illustrative example of POWER, SPEC and FREQ phenotypes.



Wavelet analysis

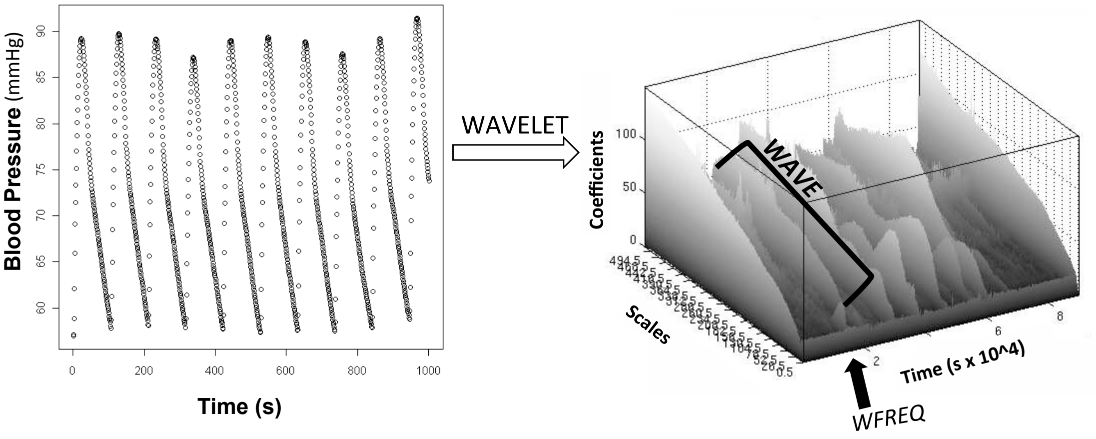
Morlet wavelet was applied

$$\psi(u)=(\pi f_b)^{-1/2}e^{-i2\pi f_c u}e^{-\frac{u^2}{f_b}} \qquad (2)$$

where u is the original time series, f_b is the bandwidth parameter, f_c is the centre frequency and $\psi(u)$ are the wavelet coefficients, followed by the continuous wavelet transform

$$\tilde{f}(s,t)=\int_{-\infty}^{\infty}\overline{\Psi}_{s,t}(u)f(u)du \qquad (3)$$

where $f(u)$ is the signal, $\tilde{f}(s,t)$ is the transform of the signal and $\Psi_{s,t}$ is a family of basis functions[4]. $\Psi_{s,t}$ can be determined by scaling a wave function; in this case, we used a scaling vector of [0.5, 0.5, 512] with the Morlet wave function. See figure below for an illustrative example of WAVE and WFREQ phenotypes.



References

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2. Welch, P. June 1967. The use of fast Fourier transform for the estimation of power spectra: A method based on time averaging over short, modified periodograms. *IEEE Transactions on Audio and Electroacoustics.* 1967:**15(2)**, 70–73.

3. Oppenheim, A. and Schafer, R. W. Discrete-Time Signal Processing, Prentice-Hall. 1989.

4. Teolis, A. Computational signal processing with wavelets, Birkhauser. 1998