**Supplemental Digital Content 3** - Physiologic waveform feature extraction \*

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| **Physiologic waveform signal** | **Signal processing method** | **Features extracted** | **Taut string є values\*** |
| Electrocardiogram (ECG) Lead II, 240 Hz sampling rate | Peak detection and taut string estimation of heart rate variability | 6 features:   * Number of line segments per heartbeat * Number of inflection segments per heartbeat * Total variation of noise per heartbeat * Total variation of denoised signal per heartbeat * Power of denoised signal * Power of noise | 0.0010  0.0258  0.0505  0.0753  0.1000 |
| Peak detection and taut string estimation | (same as row above, 6 features) | 0.0100  0.1575  0.3050  0.4525  0.6000 |
| Dual-tree complex wavelet packet transform of taut string estimation | 19 features per filter bank (2k) per wavelet transform (2), 152 total:   * Standard deviation * Shannon entropy * Log energy entropy * Energy * Power * Minimum * Mean * Maximum * Median of largest 16 * Range * Mean gradient * Kurtosis * Skewness * Complexity * Mobility * Log of variance of probability distribution * Mean value of amplitude of fast Fourier transform * Sum of auto-correlation sequence * Mean value of cross-covariance | *N/A;*  (k = 2) |
| Arterial blood pressure (ABP), 120 Hz sampling rate | Peak detection and taut string estimation | 21 features:   * Total number of peaks (1) * Time interval between consecutive systolic peaks: minimum, median, mean, maximum, standard deviation (5) * Time interval between systolic peak and subsequent diastolic peak: minimum, median, mean, maximum, standard deviation (5) * Standard deviation of relative amplitude between consecutive systolic peaks: minimum, median, mean, maximum, standard deviation (5) * Standard deviation of relative amplitude between systolic peak and subsequent diastolic peak: minimum, median, mean, maximum, standard deviation (5) | 0.1  0.7  1.3  1.9  2.5 |
| Pulse plethysmography (SpO2), 60 Hz sampling rate | Peak detection and taut string estimation | (same as row above, 21 features) | 1  8.75  16.5  24.25  32 |

*\* Methods described in further detail in:*

Hernandez L, Kim R, Tokcan N, Derksen H, Biesterveld BE, Croteau A, Williams AM, Mathis M, Najarian K, Gryak J. Multimodal tensor-based method for integrative and continuous patient monitoring during postoperative cardiac care. Artif Intell Med 2021;113:102032.