SUPPLEMENTAL MATERIAL
**Data S1**

**Feature Extraction**

We extracted hand crafted features from the electrocardiogram (ECG), blood pressure (BP), and photoplethysmogram (PPG) signals to be used in the noise, tier-1, tier-2 and tier-3 classifiers. The majority of these features have been used in a recent study aiming to reducing false ICU alarms with prior knowledge of the alarm type\(^\text{12}\).

In addition to those features, we considered arrhythmia specific features based on the heart rate (HR) as well as a set of features related to atrial fibrillation (AF) based on heart beat intervals and P-wave morphology. List of all the features used in the present work are described below.

**Electrocardiographic Features**

*Periodicity Measure* ECG signals generally follow a periodic rhythm in normal cases and in most arrhythmic cases except asystole and ventricular fibrillation (VF). One of the strongest markers of good signal quality for ECG is the degree of periodicity. Once R peaks are identified we obtain all peak-to-peak time periods and put them in an array \(I = [I_1, I_2, \ldots I_n]\). For highly periodic signals the standard deviation would be small for this array of time periods. We calculate the periodicity measure by equation (1):

\[
\text{Periodicity measure} = 1 - s_I/\bar{I}
\]  

where, \(s_I\) is the standard deviation of the array \(I\) and \(\bar{I}\) is the mean value of the array \(I\). Periodicity measure is close to zero for highly aperiodic signal and close to unity for highly periodic signals.

*Sharpness Measure* A good quality ECG has sharp QRS complexes except in the cases of VF and VT. We quantify the sharpness, \(S_i\), of the \(i\)th QRS complex by measuring the minimum absolute slope around the QRS complex. We calculate the sharpness for each QRS within the window of analysis and put it in an array \(S = [S_1, S_2, \ldots, S_n]\). The sharpness measure for an ECG signal within a window of analysis is given by equation (2):
\[ \text{Sharpness measure} = \left( \frac{2}{n} \right) \times \tan^{-1}(\bar{S}) \]  

(2)

where, \( \bar{S} \) is the mean of the array \( S \). Sharpness measure can take values between 0 and 1. An ECG signal with highly sharp QRS complexes has values close to 1.

**Correlation Measure** As a QRS complex is a repeating pattern in the ECG, it generally has a high beat-to-beat correlation. We calculate the correlation between \( n \) successive QRS complex detection and store them in an array \( C = [C_1, C_2, ..., C_{n-1}] \). Correlation measure is given by equation (3):

\[
\text{Correlation measure } (\bar{C}) = \frac{1}{n-1} \sum_{i=1}^{n-1} C_i
\]  

(3)

Correlation measure can take a value between 0 and 1. If two QRS complexes are identical then correlation measure is 1, while it is low for QRS complexes with different morphologies.

**Peak Height Stability Measure** Stable peak heights would often indicate high signal quality. Therefore, we invented the peak height stability measure. Each peak height is found by subtracting the amplitude of the ECG signal at the R peak detection by the mean amplitude of the ECG signal. All the peak heights within the window of analysis are stored in an array \( \delta P = [\delta P_1, \delta P_2, ..., \delta P_n] \). We find the peak height stability measure by equation (4):

\[
\text{Peak height stability measure } = 1 - s_{\delta P}/\bar{\delta P}
\]  

(4)

where, \( s_{\delta P} \) is the standard deviation of \( \delta P \) and \( \bar{\delta P} \) is the mean of the array \( \delta P \).

**Complexity Measure** Complexity measure is derived from the viewpoint of dynamical systems. The complexity measure was calculated by comparison and accumulation operations from a string of zeros and ones, which is a reconstruction of the original ECG data for a specific window length and an appropriate threshold. This complexity measure has been shown to effectively detect sinus rhythm, VT and VF.
**Dominant Frequency** Dominant frequency is the frequency at which the power spectrum has its highest power.\textsuperscript{18} For VF, the dominant frequency should be in the range of 2.5-8Hz.

**Maximum Power to Total Power Ratio** We hypothesized that during VF the ECG would have most of its power in a single frequency. Therefore, we invented this feature which is the maximum power to total power ratio in the frequency domain to examine how concentrated the power is in a single frequency. ECGs during VF would have a higher maximum power to total power ratio than normal ECGs.

**Co-dominant Frequencies** This refers to the number of significant frequency components besides the dominant frequency. These frequency components have minimum peak heights of 0.2 in the normalized power spectrum.\textsuperscript{35} This is another measure that describe how concentrated the power is at the dominant frequency.

**Low Frequency Power Dominant** After applying the method of amplitude envelope, one can conclude which frequency power band is the most dominant at a certain point in time. During VF, the low frequency power band should be the most dominant as VF resembles a signal of frequency 2.5-8Hz.\textsuperscript{18} Therefore, we invented a binary feature, Low Frequency Power Dominant, to indicate whether low frequency power was dominant for 4 seconds continuously for VF alarms.

**Bandwidth** Here we define the bandwidth of the ECG signal as the difference between the last and first frequencies in the normalized power spectrum that exceeds power of 0.5. During VF, the bandwidth of the ECG signal would decrease significantly.

**Mean Frequency** The frequency spectrum is characterized by its mean frequency which is the sum of the product of the spectrum intensity and its respective frequency, divided by the total sum of spectrum intensity. This is shown in equation (5):

\[
 f_{\text{mean}} = \frac{\sum I \cdot f}{\sum I} \quad (5)
\]

where, \( f \) is the frequency and \( I \) is the spectrum intensity.

**Median frequency** The frequency spectrum is also characterized by its median frequency. To find the median frequency, one has to calculate the total power of the whole spectrum first.
Then, the median frequency is the frequency at which the cumulative power (sum of all the power for lower frequencies) first exceeds half of the total power.

**Ratio of maximum power to total power ratio** We hypothesized that during VF the ECG would have most of its power in a single frequency. Therefore, we invented this feature which is the maximum power to total power ratio in the frequency domain to examine how concentrated the power is in a single frequency. ECGs during VF would have a higher maximum power to total power ratio than normal ECGs.

**Ratio of Maximum power below 12Hz to average between 15Hz and 20Hz** Is a frequency domain feature estimated by computing the ratio of maximum power below 12Hz to the average power between 15Hz and 20Hz.

**Ratio of Maximum power below 12Hz to maximum power above 15Hz** Is obtained by computing the ratio of maximum power below 12hz to the maximum power above 15Hz.

**Five consecutive ventricular tachycardia beats** We created a binary feature that indicated whether the ECG signals met the criteria of VT. If a sequence of five consecutive VT beats was found and these VT beats all occurred within 2.4 seconds, then this binary feature would be given the value of one. Otherwise, this binary feature would be given the value of zero.

**Maximum heartrate over five beats** Is the maximum heartrate estimated within a given window by considering five consecutive beats.

**Maximum difference between low frequency sub peaks** Is a frequency domain feature to identify the signature of VT and VT. It is obtained by taking the maximum difference between the low frequency sub peaks.

**Not Enough Beats** We created this binary feature to indicate whether there are enough heartbeats within the window of analysis for calculation of heart rate for classifying tachycardia alarms. The number of heartbeats required for calculation of heart rate for tachycardia is 17.

**Heart Rate** Heart rate is determined from the R peak detection. For extreme tachycardia, the fastest average heart rate from a sequence of 17 consecutive heart beats is extracted from the 8 second of the records. For extreme bradycardia, the slowest average heart rate from a sequence of 5 consecutive heart beats is extracted from 8 second of the records.
**Minimum Heart rate** is the minimum heart rate within the given 8 second window estimated based on 5 consecutive heart beats.

**Number of beats slower than 40 bpm** is the count of those heartbeats with heart rate lower than 40 beats per minute.

**Number of heartbeats** is the count of number of heartbeats within the given 8 second input data.

**HR criterion of ventricular tachycardia (VT)** We created a binary feature that indicated whether the HR met the criteria of VT. Specifically, if the HR is greater than 100 beats per minute and less than 140 beats per minute, then this binary feature would be set to one. Otherwise, this binary feature would be set to zero.

**HR criterion of extreme bradycardia (EB)** We created a binary feature that indicated whether the HR met the criteria of EB. Specifically, if the minimum HR for five consecutive beats is less than 40 beats per minute, then this binary feature would be set to one. Otherwise, this binary feature would be set to zero.

**HR criterion of extreme tachycardia (ET)** We created a binary feature that indicated whether the HR met the criteria of ET. Specifically, if the maximum HR for 17 consecutive beats is greater than 140 beats per minute, then this binary feature would be set to one. Otherwise, this binary feature would be set to zero.

**P-waveMean**: Mean P-wave peak amplitude of detected beats in the 8 s window.

**P-waveStd** Standard deviation of the P-wave peak amplitude of detected beats in the 8 s window.

**P-waveAreaMean** Mean of the P-wave area, between P-wave onset and P-wave offset of detected beats in the 8 s window.

**P-waveAreaStd** Standard deviation of the P-wave area, between P-wave onset and P-wave offset of detected beats in the 8 s window.

**PR Mean** Mean of the PR interval duration of detected beats in the 8 s window.

**PR Std** Standard deviation of the PR interval duration of detected beats in the 8 s window.
**Blood Pressure and PPG Features**

**Decreasing \( \delta P \)** During VT, blood pressure and PPG amplitude would often gradually decrease. Therefore, the binary feature, decreasing \( \delta P \), was invented to indicate whether the amplitude of the BP signal or PPG signal keep on decreasing.

**No peaks** During VF, there should be no onsets of waveforms in BP and PPG signals because the heart is not pumping blood. Therefore, we created two binary features, absence of peaks, one for the BP signal and another one for the PPG signal, to indicate whether there are onsets of waveforms in the BP and PPG signals for VF alarms.

**Maximum period** We calculated the maximum gaps between consecutive onsets of waveforms in BP and PPG signals respectively and used them as features.

**Maximum Amplitude before Onset** This is the largest amplitude before the onset of the largest gap between consecutive valleys in the considered BP or PPG signal.

**Maximum Amplitude after Onset** This is the largest amplitude after the largest gap between consecutive valleys in the considered BP or PPG signal.

**Minimum pressure at largest gap** Minimum amplitude value before the occurrence of largest gap between consecutive onsets of waveforms is used as a feature.

**PPG Amplitude Decrease** This is a binary feature that indicates whether the signal amplitude decreases after the onset of the largest gap.

**Periodicity Measure** The periods between the onsets of n waveforms were calculated and stored in an array \( I = [I_1, I_2, ..., I_{n-1}] \). For highly periodic signals the standard deviation would be small for this array of time periods. The equation used for calculating periodicity measure for BP or PPG is the same as that for ECG as illustrated in equation (1).

**\( \delta P \) Stability Measure** When the signal quality is high, the value of the maximum amplitude minus the minimum amplitude for each waveform would be quite stable during sinus rhythm in BP and PPG signals. Such values were calculated for all detected waveforms within the window of analysis and stored in an array \( \delta P = [\delta P_1, \delta P_2, ..., \delta P_n] \). \( \delta P \) Stability Measure was calculated using equation (4).

**Correlation Measure** High-quality BP and PPG signals are often very regular. Therefore, we calculated the cross-correlation coefficients between n consecutive waveforms and put them
in an array \( C = [C_1, C_2, \ldots, C_{n-1}] \). The correlation measure for the BP or PPG signals within a window of analysis is the mean of these cross-correlation coefficients, and it can be obtained from equation (6).

**Minimum heart rate** is the heart rate estimated from the corresponding BP and PPG signals using five consecutive beats within the given window of 8 seconds.

**Number of beats slower than 40 bpm** is a count of number of beats with heart rate lower than 40 beats per minute.

**Maximum heart rate** is the maximum heart rate within a given window estimated by considering 16 consecutive beats.

**Not enough beats to detect extreme tachycardia** is binary feature set to 1 if more than 16 beats are detected within the given window.

The specific set of features used in each classifier are listed in the Tables S1-S4.

**PhysioNet Data Annotation**

We used the open source training data from the “PhysioNet/Computing in Cardiology Challenge 2015: Reducing False Arrhythmia Alarms in the ICU” as an independent dataset to evaluate the proposed algorithm. The database consists of 750 intensive care unit (ICU) records with two channels of electrocardiographic (ECG) signals and either one of the arterial blood pressure (BP) and photoplethysmogram (PPG) signals, or both.

Also, the time when the bedside monitor raised an alarm, and the annotation indicating whether the alarm is true or false are provided. We first re-annotated the data to identify the time instance at which the definition/criteria for the alarm are met. The rhythm of each record has been marked based on the consensus of two cardiologists, while remaining blind to each other, as well as to the annotations of the database. We considered 15 s of data (i) in sinus rhythm, (ii) prior to false alarms, and (iii) prior to the true alarm time and marked the onset and offset times, for each of the five life threatening arrhythmia corresponding to asystole, extreme bradycardia, extreme tachycardia, ventricular tachycardia (VT) and ventricular fibrillation (VF).

Rhythms not belonging to any of the five aforementioned arrhythmias, were deemed inconclusive and not included in the analysis (Table 5). We also marked the signal quality for each
of the available physiological signals that was used for noise/artefact detection by our algorithm. Record-wise annotation details are provided in Table 5, below.

**Explainability of Convolutional Neural Networks and Feature Based Classifiers**

The ability to explain the decision of the classification algorithm enhances its significance in its clinical deployment. We used the gradient-weighted class activation mapping (grad-CAM) technique to explain the decision making process of the convolutional neural network (CNN) classifier. In particular, grad-CAM identifies those regions within the input data which result in its classification into a specific class, by using CNN layer feature maps and the gradient of a loss function with respect to the feature maps.

Specifically, let’s assume that the output of a convolution layer $L$ produces $K$ feature maps, $A^k \in \mathbb{R}^{M \times 1}$, with each element indexed by $i$. So $A_i^k$ refers to the activation at location $i$ of the feature map $A^k$. Now for a given class $c$, a weight vector $W = [w_1, w_2 \ldots w_k]$, is obtained from the mean of the gradient of the score ($Y^c$) with respect to the feature map as shown in equation (5):

$$w_k^c = \sum \frac{\partial Y^c}{\partial A_i^k}$$  \hspace{1cm} (5)

Finally, the weighted combination of all $K$ feature maps at layer $L$, given by $\sum w_k A_k$ generates the grad-CAM heatmap, which is subsequently normalized and resampled to the original signal dimension to depict the regions of interest on the input signal. In Figure S2, we visualized the class activation map of the fourth convolutional layer of the Tier-3 classifier. Specifically, we plot the first ECG channel with the gray level proportional to the output of grad-CAM. Some of the important regions (in light grey) for classification correspond to a missing P-wave and a beat with irregular preceding and following RR intervals. Such features agree with the clinical diagnosis of AF.

To understand the feature based classifier, we used the permutation importance technique to score the importance of each input feature. Specifically, each feature is randomly permuted within the original dataset to generate a permuted feature dataset. Now a feature weight is computed by taking the difference in the performance of the classifier on the original
data and on the permuted feature datasets. Finally, the feature importance score depicting the relative importance of each feature is obtained by normalizing the feature weights.

Feature importance scores for Tier-1, Tier-2 and Tier-3 classifiers are shown in the Figure S3A, Figure S3B and Figure S3C respectively. The two most important features for Tier-1 classification are the median frequency and the ratio of maximum power to total power. Both are frequency domain features that characterize the VT and VF signals that are classified in Tier-1 (Figure S3A).

Similarly important features for Tier-2 classification are ECG heart rate, ECG number of beats at a heart rate slower than 40 beats per minute and not enough ECG beats to detect extreme tachycardia. Such features are relevant in clinical practice for detecting extreme bradycardia and extreme tachycardia signals that are classified in Tier-2 (Figure S3B).

In the same vein, important features of Tier-3 classifier are the standard deviation of heart rate and P-waveAreaMean, that correlate with AF diagnosis. Indeed the feature importance scores are not surprising and most relevant clinical features are driving the classifier decisions, thus increasing the confidence in the classifier for practical deployment (Figure S3C).

To summarize, a CNN based classifier automatically extracts features from the signal to optimize the classifier performance. However, such features may not be intuitive to a clinician. In contrast, a feature based classifier clearly assigns high score to those features used in clinical practice, but may not achieve the highest classification performance. An optimal hybrid CNN approach that uses both automated feature learning along with handcrafted features achieves improved performance compared to only CNN and only feature based approaches.
Table S1. List of hand-crafted features used in noise classifier.

| Channel | Feature 1                  | Feature 2                  | Feature 3                  | Feature 4                  |
|---------|---------------------------|---------------------------|---------------------------|---------------------------|
| ECG     | Periodicity measure       | Sharpness measure         | Correlation measure       | Peak height stability measure |
|         |                           |                           |                           | maxSignalEnergyBeyond_12Hz |
| BP      | Periodicity measure       | δP Stability measure      | Correlation measure       |                           |
| PPG     | Periodicity measure       | δP Stability measure      | Correlation measure       |                           |

Features are extracted from 4 s of data from each channel of ECG, BP and PPG waveforms.
Table S2. List of hand-crafted features used in tier-1 classifier.

| Channel | Features                                                                 |
|---------|--------------------------------------------------------------------------|
| ECG     | Heart rate criterion of ventricular tachycardia                          |
|         | Heart rate                                                               |
|         | Complexity measure                                                       |
|         | Bandwidth                                                                |
|         | Dominant frequency                                                       |
|         | Mean frequency                                                           |
|         | Median frequency                                                         |
|         | Maximum amplitude                                                        |
|         | Maximum power to total power ratio                                       |
|         | Co-dominant frequencies above 0.2                                         |
|         | Co-dominant frequencies above 0.5                                         |
|         | Low frequency power dominant                                              |
|         | Ratio of Maximum power to total power                                    |
|         | Ratio of Maximum power below 12Hz to average between 15Hz and 20Hz       |
|         | Ratio of Maximum power below 12Hz to maximum power above 15Hz.           |
|         | Five consecutive ventricular tachycardia beats                            |
|         | Sharpness measure                                                        |
|         | Correlation measure                                                      |
|         | Maximum heartrate over five beats                                        |
|         | Maximum difference between low frequency sub peaks                       |
| BP      | No peaks                                                                 |
|         | Decreasing δP                                                            |
| PPG     | Decreasing δP                                                            |

Features are extracted from 4 s of data from each channel of ECG, BP and PPG waveforms.
| **ECG** | **BP** | **PPG** |
|---------|--------|---------|
| Heart rate | Maximum period | Maximum period |
| Heart rate criterion of extreme bradycardia | Maximum amplitude before onset | Maximum amplitude before onset |
| Heart rate criterion of extreme tachycardia | Maximum amplitude after onset | Maximum amplitude after onset |
| Minimum Heart rate | Minimum pressure at largest gap | Amplitude decrease |
| Number of beats slower than 40 bpm | Amplitude decrease | Amplitude decrease |
| Periodicity measure | Periodicity measure | Periodicity measure |
| Sharpness measure | δP Stability measure | δP Stability measure |
| Correlation measure | Correlation measure | Correlation measure |
| Peak height stability measure | Minimum heart rate | Minimum heart rate |
| Maximum heart rate | Number of beats slower than 40 bpm | Maximum heart rate |
| Not enough beats to detect extreme tachycardia | Maximum heart rate | Not enough beats to detect extreme tachycardia |
| Number of heartbeats | | |
| Periodicity measure |
|---------------------|
| δP Stability measure |
| Correlation measure |
| Minimum heart rate |
| Number of beats slower than 40 bpm |
| Maximum heart rate |
| Not enough beats to detect extreme tachycardia |

Features are extracted from 8 s of data from each channel of ECG, BP and PPG waveforms.
Table S4. List of hand-crafted features used in tier-3 classifier.

| ECG                  |                          |
|----------------------|--------------------------|
| Mean heart rate      |                          |
| Standard deviation of heart rate |              |
| P-waveMean           |                          |
| P-waveStd            |                          |
| P-waveAreaMean       |                          |
| P-waveAreaStd        |                          |
| PR_Mean              |                          |
| PR_Std               |                          |

Features are extracted from 8 s of data from each channel of ECG, BP and PPG waveforms.
Table S5. Sensitivity, positive predictive value (PPV) and accuracy for each rhythm following 5-times 5-fold cross-validation using only CNN and only feature based classifiers.

| Rhythm | Only-CNN | | | | Only features | | |
|--------|----------|--------|-----------------|-----------------|
|        | Sensitivity (%) | PPV (%) | Accuracy (%) | Sensitivity (%) | PPV (%) | Accuracy (%) |
| AS     | 100.00+0.00 | 61.58+0.00 | 99.42+0.00 | 100.00+0.00 | 61.58+0.00 | 99.42+0.00 |
| EB     | 95.41+1.65 | 79.7+5.4 | 98.17+0.53 | 99.7+0.30 | 79.58+3.48 | 98.38+0.31 |
| ET     | 77.63+4.30 | 74.12+6.53 | 96.77+0.65 | 91.99+3.06 | 92.71+1.94 | 98.99+0.17 |
| VF     | 82.05+6.94 | 84.46+17.3 | 99.38+0.4 | 66.04+2.67 | 66.15+2.56 | 98.89+0.06 |
| VT     | 97.36+0.56 | 88.15+2.9 | 97.39+0.55 | 96.41+0.80 | 93.10+1.72 | 98.21+0.24 |
| AF     | 89.99+1.13 | 71.08+1.85 | 86.36+1.04 | 93.63+1.93 | 68.11+2.80 | 88.23+1.02 |
| SR     | 79.59+1.04 | 85.91+2.08 | 84.89+0.99 | 72.02+4.01 | 97.08+2.08 | 86.49+1.25 |

AS: asystole; EB: extreme bradycardia; ET: extreme tachycardia; VF: ventricular fibrillation; VT: ventricular tachycardia; AF: atrial fibrillation; SR: sinus rhythm.
Table S6. Record-wise annotation for “PhysioNet/Computing in Cardiology Challenge 2015: Reducing False Arrhythmia Alarms in the ICU” training data.

| Record | Signal Quality | Rhythm            | True alarm time (s) | Arrhythmia | Onset (s) | Offset (s) |
|--------|----------------|-------------------|---------------------|------------|-----------|------------|
| a103l  | Bad Bad Good   | Noise/artifacts   | 300                 |            |           |            |
| a104s  | Bad Bad Good   | Noise/artifacts   | 300                 |            |           |            |
| a105l  | Bad Bad Good   | Noise/artifacts   | 300                 |            |           |            |
| a109l  | Good Good Good | Paced             | 300                 |            |           |            |
| a123l  | Bad Bad Bad Bad| Noise/artifacts   | 300                 |            |           |            |
| a134s  | Bad Bad Good Good| Noise/artifacts | 300                 |            |           |            |
| a142s  | Good Good Bad Bad| Asystole      | 300 295.5 300       |            |           |            |
| a145l  | Good Bad Bad   | Inconclusive      | 300                 |            |           |            |
| a152s  | Bad Bad Good   | Noise/artifacts   | 300                 |            |           |            |
| a161l  | Good Good Good | Asystole          | 299 294.3 299       |            |           |            |
| a163l  | Good Good Good | Normal Sinus Rhythm| 300             |            |           |            |
| a165l  | Good Good Good | Normal Sinus Rhythm| 300             |            |           |            |
| a167l  | Good Good Bad Bad| Paced           | 298                 |            |           |            |
| a170s  | Bad Bad Bad Bad| Noise/artifacts   | 300                 |            |           |            |
| a171l  | Good Good Good | Normal Sinus Rhythm| 300             |            |           |            |
| a172s  | Good Good Bad Bad| Paced           | 294                 |            |           |            |
| a178s  | Bad Bad Good Good| Noise/artifacts | 300                 |            |           |            |
| a185l  | Good Good Bad   | Asystole          | 299.5 295.1 299.5   |            |           |            |
| a186s  | Good Bad Bad   | Paced             | 300                 |            |           |            |
| a203l  | Good Good Bad   | Asystole          | 293 288.3 293       |            |           |            |
| a219l  | Good Bad Bad   | PVCs              | 300                 |            |           |            |
| a223l  | Bad Good Good Good| Bundle branch block| 300                |            |           |            |
| File  | Label | First | Second | Third | Description                  | Raw Rate |
|-------|-------|-------|--------|-------|-------------------------------|----------|
| a225l | Bad   | Good  | Good   | Good  | Bundle branch block           | 300      |
| a226s | Bad   | Good  | Good   | Good  | Bundle branch block           | 300      |
| a239l | Good  | Good  | Good   | Good  | Normal Sinus Rhythm           | 300      |
| a266s | Bad   | Bad   | Bad    | Noise/artifacts | 300    |
| a267l | Bad   | Bad   | Good   | Noise/artifacts | 300    |
| a272s | Good  | Good  | Good   | Good  | Normal Sinus Rhythm           | 300      |
| a273l | Good  | Bad   | Good   | Good  | Normal Sinus Rhythm           | 300      |
| a278s | Good  | Good  | Good   | Normal Sinus Rhythm | 300    |
| a279l | Bad   | Bad   | Good   | Noise/artifacts | 300    |
| a287l | Good  | Bad   | Good   | Normal Sinus Rhythm | 300    |
| a288s | Good  | Bad   | Good   | Normal Sinus Rhythm | 300    |
| a297l | Bad   | Bad   | Good   | Good  | Noise/artifacts | 300    |
| a301l | Good  | Good  | Good   | Normal Sinus Rhythm | 300    |
| a302s | Good  | Good  | Good   | Normal Sinus Rhythm | 300    |
| a306s | Bad   | Bad   | Good   | Noise/artifacts | 300    |
| a310s | Good  | Good  | Good   | Good  | Bundle branch block | 300    |
| a311l | Good  | Good  | Good   | Good  | Bundle branch block | 300    |
| a315l | Good  | Good  | Good   | Bundle branch block | 300    |
|       |       |       |        | 287.2 | 300 |
| a345l | Good  | Good  | Bad    | Bad   | Extreme bradycardia          | 296      |
| a363l | Bad   | Bad   | Good   | Noise/artifacts | 300    |
| a372s | Good  | Good  | Bad    | Asystole | 299    |
| a376s | Bad   | Bad   | Bad    | Noise/artifacts | 300    |
| a377l | Bad   | Bad   | Good   | Noise/artifacts | 300    |
| a378s | Bad   | Bad   | Good   | Noise/artifacts | 300    |
| a382s | Bad   | Bad   | Bad    | Inconclusive | 300    |
| a385l | Good  | Good  | Bad    | Cardiopulmonary resuscitation | 15    |
| a386s | Bad   | Bad   | Bad    | Inconclusive | 300    |
| Callout   | Rhythm 1 | Rhythm 2 | Rhythm 3 | Notes             | Duration |
|-----------|----------|----------|----------|-------------------|----------|
| a391l     | Bad      | Bad      | Bad      | Noise/artifacts   | 300      |
| a396s     | Bad      | Bad      | Good     | Noise/artifacts   | 300      |
| a397l     | Good     | Good     | Good     | Normal Sinus Rhythm | 300      |
| a420s     | Good     | Good     | Good     | PVCs              | 300      |
| a422s     | Good     | Good     | Good     | Bundle branch block | 300      |
| a429l     | Good     | Good     | Good     | Paced             | 300      |
| a435l     | Bad      | Bad      | Bad      | Noise/artifacts   | 300      |
| a436s     | Bad      | Bad      | Good     | Noise/artifacts   | 300      |
| a439l     | Bad      | Bad      | Good     | Noise/artifacts   | 300      |
| a442s     | Good     | Good     | Bad      | Asystole          | 291      |
|           |          |          |          |                   | 287      |
|           |          |          |          |                   | 291      |
| a443l     | Good     | Good     | Bad      | Paced             | 300      |
| a446s     | Good     | Good     | Bad      | Asystole          | 295.5    |
|           |          |          |          |                   | 291.2    |
|           |          |          |          |                   | 295.5    |
| a449l     | Good     | Good     | Bad      | Asystole          | 300      |
|           |          |          |          |                   | 295.2    |
|           |          |          |          |                   | 300      |
| a457l     | Bad      | Bad      | Good     | Noise/artifacts   | 300      |
| a461l     | Bad      | Bad      | Good     | Bad               | Inconclusive | 300 |
| a462s     | Bad      | Bad      | Good     | Good              | Noise/artifacts | 300 |
| a465l     | Bad      | Bad      | Good     | Good              | Noise/artifacts | 300 |
| a490s     | Bad      | Bad      | Good     | Bad               | Noise/artifacts | 300 |
| a512s     | Good     | Bad      | Good     | Bundle branch block | 300      |
| a514s     | Bad      | Bad      | Bad      | Bundle branch block | 300      |
| a526s     | Bad      | Bad      | Good     | Noise/artifacts   | 300      |
| a527l     | Bad      | Bad      | Good     | Bad               | Noise/artifacts | 300 |
| a539l     | Inconclusive | Inconclusive | Bad | Bad | Inconclusive | 300 |
| a550s     | Bad      | Bad      | Good     | Noise/artifacts   | 300      |
| a555l     | Good     | Good     | Good     | Good              | Normal Sinus Rhythm | 300 |
| a555l     | Good     | Good     | Good     | Good              | Normal Sinus Rhythm | 135 |
| Patient | Quality | Quality | Quality | Quality | Rhythm                        | Rate |
|---------|---------|---------|---------|---------|-------------------------------|------|
| a555l   | Good    | Good    | Good    | Good    | Normal Sinus Rhythm           | 120  |
| a555l   | Good    | Good    | Good    | Good    | Normal Sinus Rhythm           | 150  |
| a555l   | Good    | Good    | Good    | Good    | Normal Sinus Rhythm           | 165  |
| a555l   | Good    | Good    | Good    | Good    | Normal Sinus Rhythm           | 180  |
| a555l   | Good    | Good    | Good    | Good    | Normal Sinus Rhythm           | 195  |
| a555l   | Good    | Good    | Good    | Good    | Normal Sinus Rhythm           | 90   |
| a555l   | Good    | Good    | Good    | Good    | Normal Sinus Rhythm           | 105  |
| a555l   | Good    | Good    | Good    | Good    | Normal Sinus Rhythm           | 210  |
| a555l   | Good    | Good    | Good    | Good    | Normal Sinus Rhythm           | 255  |
| a555l   | Good    | Good    | Good    | Good    | Normal Sinus Rhythm           | 285  |
| a555l   | Good    | Good    | Good    | Good    | Normal Sinus Rhythm           | 225  |
| a555l   | Good    | Good    | Good    | Good    | Normal Sinus Rhythm           | 240  |
| a555l   | Good    | Good    | Good    | Good    | Normal Sinus Rhythm           | 270  |
| a556s   | Good    | Good    | Good    | Good    | Normal Sinus Rhythm           | 300  |
| a558s   | Good    | Good    | Good    | Good    | Normal Sinus Rhythm           | 300  |
| a582s   | Bad     | Bad     | Bad     | Bad     | Noise/artifacts              | 300  |
| a584s   | Good    | Good    | Good    |         | Paced                         | 300  |
| a591l   | Bad     | Bad     | Bad     | Bad     | Noise/artifacts              | 300  |
| a599l   | Bad     | Bad     | Good    |         | Noise/artifacts              | 300  |
| a603l   | Good    | Good    | Bad     |         | Paced                         | 300  |
| a604s   | Good    | Good    | Good    |         | Asystole                      | 298  |
| a606s   | Bad     | Bad     | Bad     |         | Noise/artifacts              | 300  |
| a608s   | Bad     | Bad     | Good    |         | Noise/artifacts              | 300  |
| a624s   | Good    | Bad     | Good    |         | Normal Sinus Rhythm           | 300  |
| a631l   | Good    | Bad     | Good    |         | Noise/artifacts              | 300  |
| a639l   | Bad     | Bad     | Good    |         | Paced                         | 299.5|
| a645l   | Bad     | Bad     | Good    |         | Noise/artifacts              | 300  |
| a650s   | Bad     | Bad     | Good    |         | Noise/artifacts              | 300  |
| Patient ID | Lead 1 | Lead 2 | Lead 3 | Lead 4 | Diagnoses                  | Proba1 | Proba2 | Proba3 |
|------------|--------|--------|--------|--------|---------------------------|--------|--------|--------|
| a651l      | Bad    | Bad    | Good   | Good   | Inconclusive              | 300    |        |        |
| a653l      | Good   | Good   | Good   |        | Asystole                  | 301    | 296.6  | 301    |
| a653l      | Good   | Good   | Good   |        | Bundle branch block       |        | 135    |        |
| a654s      | Good   | Good   | Bad    |        | Drop beat                 | 300    |        |        |
| a661l      | Bad    | Bad    | Bad    |        | Noise/artifacts           | 300    |        |        |
| a667l      | Bad    | Bad    | Bad    |        | Noise/artifacts           | 300    |        |        |
| a668s      | Bad    | Bad    | Bad    |        | Noise/artifacts           | 300    |        |        |
| a670s      | Good   | Good   | Good   |        | Paced                     | 300    |        |        |
| a673l      | Bad    | Bad    | Bad    |        | Noise/artifacts           | 300    |        |        |
| a675l      | Bad    | Bad    | Good   |        | Noise/artifacts           | 300    |        |        |
| a694s      | Good   | Good   | Good   |        | Normal Sinus Rhythm       | 300    |        |        |
| a699l      | Bad    | Bad    | Bad    |        | Noise/artifacts           | 300    |        |        |
| a705l      | Good   | Bad    | Bad    |        | Noise/artifacts           | 300    |        |        |
| a712s      | Bad    | Bad    | Bad    |        | Noise/artifacts           | 300    |        |        |
| a715l      | Good   | Good   | Good   |        | Paced                     | 300    |        |        |
| a723l      | Bad    | Bad    | Good   |        | Noise/artifacts           | 300    |        |        |
| a735l      | Bad    | Bad    | Bad    | Good   | Noise/artifacts           | 300    |        |        |
| a740s      | Good   | Bad    | Good   |        | Normal Sinus Rhythm       | 300    |        |        |
| a746s      | Bad    | Good   | Good   |        | Normal Sinus Rhythm       | 300    |        |        |
| a750s      | Bad    | Good   | Bad    |        | Noise/artifacts           | 300    |        |        |
| a754s      | Good   | Good   | Good   |        | Paced                     | 300    |        |        |
| a776s      | Bad    | Bad    | Good   |        | Paced                     | 299.75 |        |        |
| a778s      | Bad    | Bad    | Bad    | Good   | Noise/artifacts           | 300    |        |        |
| a780s      | Bad    | Good   | Bad    |        | Noise/artifacts           | 300    |        |        |
| a785l      | Bad    | Bad    | Bad    |        | Noise/artifacts           | 300    |        |        |
| a796s      | Good   | Good   | Bad    |        | Asystole                  | 298    | 293.8  | 298    |
| a798s      | Bad    | Good   | Good   |        | Noise/artifacts           | 300    |        |        |
| a802s      | Good   | Good   | Bad    |        | Normal Sinus Rhythm       | 300    |        |        |
| Patient | QRS | P | T | QT | Diagnosis                  | Rate 1 | Rate 2 | Rate 3 |
|---------|-----|---|---|----|---------------------------|--------|--------|--------|
| a807l   | Good| Good| Bad| Good| Paced                     | 300    |
| a810s   | Good| Good| Good| Good| VT                        | 300    | 290    | 295    |
| a810s   | Good| Good| Good| Good| Normal Sinus Rhythm       | 135    |
| a810s   | Good| Good| Good| Good| Normal Sinus Rhythm       | 15     |
| a810s   | Good| Good| Good| Good| Normal Sinus Rhythm       | 120    |
| a810s   | Good| Good| Good| Good| Normal Sinus Rhythm       | 135    |
| a810s   | Good| Good| Good| Good| Normal Sinus Rhythm       | 30     |
| a810s   | Good| Good| Good| Good| Normal Sinus Rhythm       | 45     |
| a810s   | Good| Good| Good| Good| Normal Sinus Rhythm       | 60     |
| a810s   | Good| Good| Good| Good| Normal Sinus Rhythm       | 75     |
| a810s   | Good| Good| Good| Good| Normal Sinus Rhythm       | 90     |
| a810s   | Good| Good| Good| Good| Noise/artifacts           | 135    |
| a822s   | Good| Good| Good| Good| Paced                     | 300    |
| a825l   | Bad | Bad | Good| Noise/artifacts           | 300    |
| a847l   | Good| Good| Good| Paced| 300    |
| b124s   | Good| Good| Good| Extreme bradycardia       | 299    | 290    | 299    |
| b125l   | Good| Good| Good| Normal Sinus Rhythm       | 299    |
| b126s   | Good| Good| Good| Extreme bradycardia       | 300    | 291.5  | 300    |
| b183l   | Good| Good| Good| Extreme bradycardia       | 300    | 291.7  | 300    |
| b183l   | Good| Good| Good| Normal Sinus Rhythm       | 15     |
| b184s   | Bad | Bad | Good| Noise/artifacts           | 300    |
| b187l   | Bad | Bad | Good| Paced                     | 300    |
| b215l   | Bad | Bad | Bad | Good| Noise/artifacts           | 300    |
| b216s   | Good| Bad | Bad | Good| Noise/artifacts           | 300    |
| b220s   | Good| Good| Bad | Bundle branch block       | 300    | 290    | 300    |
| b227l   | Good| Good| Good| Extreme bradycardia       | 300    | 292.5  | 300    |
| b228s   | Good| Good| Good| Extreme bradycardia       | 300    | 292.6  | 300    |
| b228s   | Good| Good| Good| Normal Sinus Rhythm       | 15     |
| Patient | QRS | PR | PT | Diagnosis                  | Rate 1 | Rate 2 | Rate 3 |
|---------|-----|----|----|---------------------------|--------|--------|--------|
| b229l   | Good| Good| Good| Extreme bradycardia       | 300    | 292    | 300    |
| b231l   | Good| Bad | Bad | Good                      | Noise/artifacts | 300    |
| b231l   | Good| Good| Good| Good                      | Normal Sinus Rhythm | 135    |
| b231l   | Good| Good| Good| Good                      | Normal Sinus Rhythm | 15     |
| b265l   | Good| Good| Good| Extreme bradycardia       | 300    | 286    | 300    |
| b265l   | Good| Good| Good| Good                      | Normal Sinus Rhythm | 15     |
| b268s   | Good| Good| Good| Good                      | Paced   | 300    |
| b269l   | Good| Good| Bad | Extreme bradycardia       | 300    | 289.5  | 300    |
| b285l   | Good| Good| Good| Good                      | Paced   | 300    |
| b286s   | Good| Good| Good| Good                      | Paced   | 300    |
| b299l   | Good| Good| Good| Extreme bradycardia       | 300    | 285    | 300    |
| b308s   | Bad | Bad | Good| Good                      | Noise/artifacts | 300    |
| b313l   | Good| Good| Good| Good                      | Normal Sinus Rhythm | 300    |
| b313l   | Good| Good| Good| Good                      | Normal Sinus Rhythm | 135    |
| b313l   | Good| Good| Good| Good                      | Normal Sinus Rhythm | 15     |
| b314s   | Bad | Bad | Bad | Good                      | Noise/artifacts | 300    |
| b330s   | Bad | Bad | Good| Good                      | Noise/artifacts | 300    |
| b331l   | Bad | Bad | Good| Good                      | Noise/artifacts | 300    |
| b332s   | Bad | Bad | Good| Good                      | Noise/artifacts | 300    |
| b339l   | Good| Good| Bad | Good                      | Normal Sinus Rhythm | 300    |
| b339l   | Good| Good| Good| Good                      | Normal Sinus Rhythm | 15     |
| b340s   | Good| Good| Bad | Good                      | Normal Sinus Rhythm | 300    |
| b340s   | Good| Good| Good| Good                      | Normal Sinus Rhythm | 135    |
| b340s   | Good| Good| Good| Good                      | Normal Sinus Rhythm | 15     |
| b341l   | Good| Good| Good| Good                      | Normal Sinus Rhythm | 300    |
| b341l   | Good| Good| Good| Good                      | Normal Sinus Rhythm | 15     |
| b349l   | Good| Good| Good| Bundle branch block       | 300    |
| b349l   | Good| Good| Good| Bundle branch block       | 135    |
| Case  | Lead  | Appearance | Quality | Diagnosis               | Rate (bpm) | Other Parameters |
|-------|-------|------------|---------|-------------------------|------------|------------------|
| b349l | Good  | Good       | Good    | Bundle branch block     | 15         |                  |
| b379l | Good  | Good       | Good    | Paced                   | 300        |                  |
| b387l | Good  | Good       | Good    | Normal Sinus Rhythm     | 300        |                  |
| b388s | Good  | Good       | Bad     | Normal Sinus Rhythm     | 300        |                  |
| b389l | Good  | Bad        | Good    | Normal Sinus Rhythm     | 300        |                  |
| b428s | Bad   | Good       | Good    | Paced                   | 300        |                  |
| b451l | Good  | Bad        | Good    | PACs                    | 300        |                  |
| b455l | Good  | Good       | Good    | Extreme bradycardia     | 300        | 289.7 298.7      |
| b456s | Good  | Good       | Good    | Extreme bradycardia     | 300        | 290.5 299        |
| b484s | Good  | Bad        | Bad     | Normal Sinus Rhythm     | 300        |                  |
| b485l | Good  | Bad        | Good    | Noise/artifacts         | 300        |                  |
| b486s | Good  | Bad        | Bad     | Normal Sinus Rhythm     | 300        |                  |
| b486s | Good  | Good       | Good    | Normal Sinus Rhythm     | 15         |                  |
| b487l | Good  | Good       | Bad     | Normal Sinus Rhythm     | 300        |                  |
| b488s | Good  | Good       | Good    | Normal Sinus Rhythm     | 300        |                  |
| b494s | Good  | Good       | Good    | Paced                   | 300        |                  |
| b495l | Good  | Good       | Good    | Paced                   | 300        |                  |
| b497l | Good  | Good       | Good    | Paced                   | 300        |                  |
| b515l | Good  | Good       | Good    | Extreme bradycardia     | 300        | 280.6 298        |
| b516s | Good  | Good       | Good    | Extreme bradycardia     | 300        | 283.5 299        |
| b517l | Good  | Good       | Good    | Extreme bradycardia     | 300        | 286 298          |
| b528s | Bad   | Bad        | Bad     | Normal Sinus Rhythm     | 300        |                  |
| b537l | Good  | Good       | Good    | Extreme bradycardia     | 300        | 290.4 297.5      |
| b538s | Good  | Good       | Good    | Extreme bradycardia     | 300        | 290.3 300        |
| b553l | Good  | Good       | Bad     | Paced                   | 300        |                  |
| b554s | Good  | Good       | Good    | Paced                   | 300        |                  |
| b560s | Good  | Good       | Good    | Extreme bradycardia     | 300        | 286.5 300        |
| b561l | Good  | Good       | Good    | Extreme bradycardia     | 300        | 285 300          |
| File | Lead 1 | Lead 2 | Lead 3 | Lead 4 | Diagnosis | Lead 1 Rate | Lead 2 Rate | Lead 3 Rate |
|------|--------|--------|--------|--------|-----------|-------------|-------------|-------------|
| b562s | Good   | Good   | Good   | Good   | Extreme bradycardia | 300          | 286          | 300          |
| b578s | Good   | Good   | Good   |        | Paced     | 300          |             |             |
| b587l | Bad     | Bad     | Bad     |        | Noise/artifacts | 300          |             |             |
| b588s | Good   | Good   | Bad     |        | Extreme bradycardia | 300          | 293          | 299.9        |
| b588s | Good   | Good   | Good   |        | Normal Sinus Rhythm | 135          |             |             |
| b588s | Good   | Good   | Good   |        | Normal Sinus Rhythm | 15           |             |             |
| b600s | Bad     | Bad     | Good    | Good   | Noise/artifacts | 300          |             |             |
| b617l | Good   | Good   | Bad     |        | Bundle branch block | 300          |             |             |
| b656s | Good   | Good   | Good   |        | Extreme bradycardia | 300          | 291.2        | 300          |
| b659l | Good   | Good   | Bad     | Bad    | Extreme bradycardia | 300          | 289.5        | 300          |
| b664s | Good   | Good   | Good   |        | Extreme bradycardia | 300          | 292.8        | 300          |
| b669l | Bad     | Bad     | Good    |        | Noise/artifacts | 300          |             |             |
| b672s | Good   | Good   | Good    |        | Paced     | 300          |             |             |
| b681l | Bad     | Bad     | Good    | Good   | Noise/artifacts | 300          |             |             |
| b684s | Good   | Good   | Bad     | Good   | Normal Sinus Rhythm | 300          |             |             |
| b685l | Good   | Good   | Good   |        | Normal Sinus Rhythm | 300          |             |             |
| b685l | Good   | Good   | Good   |        | Normal Sinus Rhythm | 15           |             |             |
| b695l | Bad     | Bad     | Good    | Good   | Noise/artifacts | 300          |             |             |
| b703l | Good   | Good   | Bad     |        | Normal Sinus Rhythm | 300          |             |             |
| b706s | Bad     | Bad     | Bad     | Good   | Noise/artifacts | 300          |             |             |
| b708s | Good   | Good   | Good    |        | Paced     | 300          |             |             |
| b722s | Good   | Good   | Good    |        | Paced     | 300          |             |             |
| b730s | Good   | Good   | Good    |        | Normal Sinus Rhythm | 300          |             |             |
| b734s | Good   | Good   | Good    |        | Normal Sinus Rhythm | 300          |             |             |
| b734s | Good   | Good   | Good    |        | Normal Sinus Rhythm | 15           |             |             |
| b753l | Good   | Good   | Bad     |        | Normal Sinus Rhythm | 300          |             |             |
| b757l | Good   | Good   | Good    |        | Paced     | 300          |             |             |
| b764s | Good   | Good   | Good    |        | Extreme bradycardia | 300          | 285          | 300          |
| Patient | Status 1 | Status 2 | Status 3 | Diagnosis                  | RR Ratio | RR Value | P value |
|---------|----------|----------|----------|---------------------------|----------|----------|---------|
| b794s   | Good     | Good     | Good     | Extreme bradycardia       | 300      | 291.7    | 300     |
| b794s   | Good     | Good     | Good     | Normal Sinus Rhythm       | 135      |          |         |
| b794s   | Good     | Good     | Good     | Normal Sinus Rhythm       | 15       |          |         |
| b820s   | Good     | Good     | Good     | Extreme bradycardia       | 300      | 287.4    | 300     |
| b824s   | Good     | Good     | Good     | Paced                     | 300      |          |         |
| b824s   | Good     | Good     | Good     | Normal Sinus Rhythm       | 135      |          |         |
| b824s   | Good     | Good     | Good     | Normal Sinus Rhythm       | 195      |          |         |
| b824s   | Good     | Good     | Good     | Normal Sinus Rhythm       | 210      |          |         |
| b824s   | Good     | Good     | Good     | Normal Sinus Rhythm       | 225      |          |         |
| b824s   | Good     | Good     | Good     | Normal Sinus Rhythm       | 240      |          |         |
| b824s   | Good     | Good     | Good     | Normal Sinus Rhythm       | 255      |          |         |
| b824s   | Good     | Good     | Good     | Normal Sinus Rhythm       | 270      |          |         |
| b824s   | Good     | Good     | Good     | Normal Sinus Rhythm       | 285      |          |         |
| b824s   | Good     | Good     | Good     | Normal Sinus Rhythm       | 15       |          |         |
| b832s   | Good     | Bad      | Good     | Noise/artifacts           | 300      | 291.3    | 300     |
| b835l   | Bad      | Bad      | Good     | Noise/artifacts           | 300      |          |         |
| b838s   | Good     | Good     | Good     | Extreme bradycardia       | 300      | 292.3    | 300     |
| b839l   | Good     | Bad      | Bad      | Extreme bradycardia       | 300      | 290      | 300     |
| b840s   | Good     | Good     | Bad      | Normal Sinus Rhythm       | 300      |          |         |
| b841l   | Good     | Good     | Good     | Paced                     | 300      |          |         |
| b849l   | Good     | Bad      | Good     | Normal Sinus Rhythm       | 300      |          |         |
| f120s   | Good     | Good     | Good     | VT                        | 300      | 289      | 300     |
| f121l   | Good     | Good     | Good     | VT                        | 300      | 291.8    | 298     |
| f129l   | Good     | Good     | Good     | ST elevation              | 300      |          |         |
| f130s   | Good     | Good     | Good     | ST elevation              | 300      |          |         |
| f137l   | Good     | Bad      | Good     | Paced                     | 300      |          |         |
| f138s   | Bad      | Bad      | Bad      | Paced                     | 300      |          |         |
| f144s   | Bad      | Good     | Bad      | Normal Sinus Rhythm       | 300      |          |         |
|   |   |   |   |   |   |
|---|---|---|---|---|---|
| f189l | Bad | Bad | Good | Noise/artifacts | 300 |
| f190s | Good | Bad | Bad | Paced | 300 |
| f196s | Good | Good | Good | PVCs | 300 |
| f196s | Good | Good | Good | PVCs | 135 |
| f196s | Good | Good | Good | PVCs | 15 |
| f196s | Good | Good | Good | PVCs | 120 |
| f196s | Good | Good | Good | Normal Sinus Rhythm | 30 |
| f196s | Good | Good | Good | Normal Sinus Rhythm | 45 |
| f196s | Good | Good | Good | PVCs | 60 |
| f196s | Good | Good | Good | PVCs | 75 |
| f196s | Good | Good | Good | PVCs | 90 |
| f196s | Good | Good | Good | PVCs | 105 |
| f236s | Good | Bad | Good | Noise/artifacts | 300 |
| f237l | Bad | Bad | Good | Noise/artifacts | 300 |
| f260s | Bad | Bad | Bad | Noise/artifacts | 300 |
| f261l | Bad | Bad | Good | Noise/artifacts | 300 |
| f281l | Bad | Good | Good | Noise/artifacts | 300 |
| f304s | Good | Bad | Good | Noise/artifacts | 300 |
| f3211 | Bad | Bad | Bad | Noise/artifacts | 300 |
| f346s | Bad | Bad | Bad | Bad | Noise/artifacts | 300 |
| f352s | Good | Bad | Good | Good | PVCs | 300 |
| f362s | Bad | Bad | Good | Bad | Noise/artifacts | 300 |
| f362s | Good | Good | Good | Good | Normal Sinus Rhythm | 135 |
| f362s | Good | Good | Good | Good | Normal Sinus Rhythm | 15 |
| f362s | Good | Good | Good | Good | Normal Sinus Rhythm | 120 |
| f362s | Good | Good | Good | Good | Normal Sinus Rhythm | 150 |
| f362s | Good | Good | Good | Good | Normal Sinus Rhythm | 165 |
| f362s | Good | Good | Good | Good | Normal Sinus Rhythm | 30 |
| f362s | Good | Good | Good | Good | Normal Sinus Rhythm | 180 |
|-------|------|------|------|------|---------------------|-----|
| f362s | Good | Good | Good | Good | Normal Sinus Rhythm | 195 |
| f362s | Good | Good | Good | Good | Normal Sinus Rhythm | 45  |
| f362s | Good | Good | Good | Good | Normal Sinus Rhythm | 60  |
| f362s | Good | Good | Good | Good | Normal Sinus Rhythm | 75  |
| f362s | Good | Good | Good | Good | Normal Sinus Rhythm | 90  |
| f362s | Good | Good | Good | Good | Normal Sinus Rhythm | 105 |
| f407l | Bad  | Bad  | Good | Good | Noise/artifacts     | 300 |
| f408s | Bad  | Bad  | Good | Good | Noise/artifacts     | 300 |
| f414s | Bad  | Bad  | Bad  |      | Noise/artifacts     | 300 |
| f415l | Bad  | Bad  | Bad  |      | Noise/artifacts     | 300 |
| f440s | Bad  | Bad  | Good |      | Noise/artifacts     | 300 |
| f441l | Bad  | Bad  | Good |      | Noise/artifacts     | 300 |
| f450s | Good | Good | Bad  |      | VF                  | 294 | 289.3 | 294 |
| f474s | Bad  | Bad  | Bad  |      | Noise/artifacts     | 300 |
| f493l | Good | Good | Good |      | Paced               | 300 |
| f499l | Good | Good | Good |      | VT                  | 300 | 291.8 | 300 |
| f500s | Good | Bad  | Good | Good | Noise/artifacts     | 300 |
| f529l | Bad  | Bad  | Bad  | Good | Noise/artifacts     | 300 |
| f530s | Bad  | Bad  | Bad  |      | Noise/artifacts     | 300 |
| f543l | Good | Good | Bad  | Bad  | VF                  | 214 | 207.8 | 214 |
| f544s | Good | Good | Good | Bad  | VF                  | 298 | 293.9 | 298 |
| f544s | Good | Good | Good | Good | Normal Sinus Rhythm | 135 |
| f544s | Good | Good | Good | Good | Normal Sinus Rhythm | 15  |
| f545l | Good | Good | Bad  | Bad  | VF                  | 27  | 21.9  | 27  |
| f563l | Good | Good | Good | Bad  | VF                  | 296 | 290   | 296 |
| f572s | Bad  | Bad  | Good |      | Noise/artifacts     | 300 |
| f576s | Bad  | Bad  | Good |      | Noise/artifacts     | 300 |
| File | Quality | Pacing | Diagnoses                  | Notes   | Score 1 | Score 2 | Score 3 |
|------|---------|--------|---------------------------|---------|---------|---------|---------|
| f586s | Bad     | Good   | Good                      | Noise/artifacts | 300     |         |         |
| f592s | Good    | Good   | Good                      | Bundle branch block | 300     |         |         |
| f593l | Bad     | Good   | Good                      | Normal Sinus Rhythm | 300     |         |         |
| f602s | Bad     | Bad    | Bad                       | Noise/artifacts | 300     |         |         |
| f605l | Good    | Good   | Good                      | Bundle branch block | 300     |         |         |
| f605l | Good    | Good   | Good                      | Bundle branch block | 15      |         |         |
| f610s | Bad     | Bad    | Bad                       | Noise/artifacts | 300     |         |         |
| f613l | Good    | Bad    | Bad                       | Noise/artifacts | 300     |         |         |
| f618s | Good    | Bad    | Good                      | Normal Sinus Rhythm | 300     |         |         |
| f637l | Good    | Bad    | Good                      | Normal Sinus Rhythm | 300     |         |         |
| f642s | Good    | Bad    | Good                      | Noise/artifacts | 300     |         |         |
| f657l | Bad     | Bad    | Bad                       | Noise/artifacts | 300     |         |         |
| f691l | Bad     | Bad    | Bad                       | Noise/artifacts | 300     |         |         |
| f697l | Good    | Good   | Good                      | VF       | 92      | 87.5    | 92      |
| f751l | Bad     | Good   | Good                      | PVCs     | 300     |         |         |
| f768s | Bad     | Bad    | Bad                       | Noise/artifacts | 300     |         |         |
| f768s | Good    | Good   | Good                      | PVCs     | 210     |         |         |
| f768s | Good    | Good   | Good                      | PVCs     | 45      |         |         |
| f789l | Good    | Bad    | Good                      | Noise/artifacts | 300     |         |         |
| f792s | Bad     | Bad    | Bad                       | Noise/artifacts | 300     |         |         |
| f799l | Bad     | Bad    | Bad                       | Noise/artifacts | 300     |         |         |
| f829l | Bad     | Good   | Bad                       | Inconclusive | 300     |         |         |
| t106s | Good    | Good   | Bad                       | Extreme Tachycardia | 300     | 290.8   | 300     |
| t107l | Good    | Good   | Good                      | Extreme Tachycardia | 300     | 285.5   | 300     |
| t108s | Good    | Good   | Bad                       | Extreme Tachycardia | 300     | 292.4   | 300     |
| t110s | Good    | Good   | Good                      | Extreme Tachycardia | 300     | 285     | 300     |
| t112s | Bad     | Good   | Bad                       | Extreme Tachycardia | 300     | 285     | 300     |
| t114s | Good    | Bad    | Bad                       | Extreme Tachycardia | 300     | 285.5   | 300     |
| Time   | Quality | Noise Quality | Artifact Quality | Diagnosis                  | Initial Rate | Adjusted Rate | Final Rate |
|--------|---------|---------------|-----------------|----------------------------|--------------|---------------|------------|
| t116s  | Bad     | Bad           | Good            | Noise/artifacts            |              | 300           |            |
| t117l  | Good    | Good          | Bad             | Extreme Tachycardia        |              | 300           | 285        |
| t118s  | Good    | Good          | Bad             | Extreme Tachycardia        |              | 300           | 290.5      |
| t149l  | Good    | Good          | Good            | Extreme Tachycardia        |              | 300           | 285        |
| t150s  | Good    | Good          | Bad             | Extreme Tachycardia        |              | 300           | 286.5      |
| t151l  | Good    | Good          | Bad             | Extreme Tachycardia        |              | 300           | 287        |
| t156s  | Good    | Good          | Bad             | Extreme Tachycardia        |              | 299           | 291        |
| t157l  | Good    | Good          | Good            | Normal Sinus Rhythm        |              | 300           |            |
| t157l  | Good    | Good          | Good            | Normal Sinus Rhythm        |              | 135           |            |
| t157l  | Good    | Good          | Good            | Normal Sinus Rhythm        |              | 15           |            |
| t173l  | Good    | Good          | Good            | Normal Sinus Rhythm        |              | 135           |            |
| t173l  | Good    | Good          | Good            | Normal Sinus Rhythm        |              | 120           |            |
| t173l  | Good    | Good          | Good            | Normal Sinus Rhythm        |              | 135           |            |
| t173l  | Good    | Good          | Good            | Normal Sinus Rhythm        |              | 150           |            |
| t173l  | Good    | Good          | Good            | Normal Sinus Rhythm        |              | 165           |            |
| t173l  | Good    | Good          | Good            | Normal Sinus Rhythm        |              | 30            |            |
| t173l  | Good    | Good          | Good            | Normal Sinus Rhythm        |              | 210           |            |
| t173l  | Good    | Good          | Good            | Normal Sinus Rhythm        |              | 255           |            |
| t173l  | Good    | Good          | Good            | Normal Sinus Rhythm        |              | 45            |            |
| t173l  | Good    | Good          | Good            | Normal Sinus Rhythm        |              | 60            |            |
| t173l  | Good    | Good          | Good            | Normal Sinus Rhythm        |              | 75            |            |
| t173l  | Good    | Good          | Good            | Normal Sinus Rhythm        |              | 90            |            |
| t173l  | Good    | Good          | Good            | Normal Sinus Rhythm        |              | 105           |            |
| t173l  | Good    | Good          | Good            | Normal Sinus Rhythm        |              | 15            |            |
| t174s  | Good    | Good          | Good            | Extreme Tachycardia        |              | 300           | 285        |
| t175l  | Good    | Good          | Good            | Extreme Tachycardia        |              | 300           | 285        |
| t191l  | Good    | Good          | Good            | Extreme Tachycardia        |              | 300           | 292        |
| Time  | Quality | Rate | Status                  | Rate 1 | Rate 2 | Rate 3 |
|-------|---------|------|-------------------------|--------|--------|--------|
| t191l | Good    | Good | Good                    | Normal Sinus Rhythm | 180    |        |
| t191l | Good    | Good | Good                    | Normal Sinus Rhythm | 195    |        |
| t191l | Good    | Good | Good                    | Normal Sinus Rhythm | 210    |        |
| t191l | Good    | Good | Good                    | Normal Sinus Rhythm | 225    |        |
| t191l | Good    | Good | Good                    | Normal Sinus Rhythm | 240    |        |
| t191l | Bad     | Good | Good                    | Noise/artifacts    | 255    |        |
| t191l | Good    | Good | Good                    | Normal Sinus Rhythm | 270    |        |
| t191l | Good    | Good | Good                    | Normal Sinus Rhythm | 285    |        |
| t192s | Good    | Good | Good                    | Normal Sinus Rhythm | 299.5  |        |
| t193l | Good    | Good | Good                    | Extreme Tachycardia | 300    | 293    | 300    |
| t195l | Good    | Good | Good                    | PVCs              | 300    |        |
| t208s | Bad     | Good | Good                    | Extreme Tachycardia | 299.5  | 292    | 299.5  |
| t209l | Good    | Good | Good                    | Normal Sinus Rhythm | 299.5  |        |
| t213l | Good    | Good | Good                    | Extreme Tachycardia | 300    | 289    | 300    |
| t214s | Good    | Good | Good                    | Extreme Tachycardia | 300    | 290    | 300    |
| t214s | Good    | Good | Good                    | Normal Sinus Rhythm | 135    |        |
| t214s | Good    | Good | Good                    | Normal Sinus Rhythm | 15     |        |
| t214s | Good    | Good | Good                    | Extreme Tachycardia | 120    | 110    | 120    |
| t214s | Good    | Good | Good                    | Extreme Tachycardia | 150    | 135.8  | 145.6  |
| t214s | Good    | Good | Good                    | PVCs              | 165    |        |
| t214s | Good    | Good | Good                    | Normal Sinus Rhythm | 30     |        |
| t214s | Good    | Good | Good                    | Normal Sinus Rhythm | 180    |        |
| t214s | Good    | Good | Good                    | Normal Sinus Rhythm | 45     |        |
| t214s | Good    | Good | Good                    | Normal Sinus Rhythm | 60     |        |
| t214s | Good    | Good | Good                    | Normal Sinus Rhythm | 75     |        |
| t214s | Good    | Good | Good                    | Normal Sinus Rhythm | 90     |        |
| t214s | Good    | Good | Good                    | Extreme Tachycardia | 105    | 90.9   | 99.33  |
| t234s | Good    | Good | Good                    | Extreme Tachycardia | 300    | 290.5  | 300    |
| t234s | Good | Good | Good | Normal Sinus Rhythm | 135 |
|-------|------|------|------|---------------------|-----|
| t234s | Good | Good | Good | Normal Sinus Rhythm | 30  |
| t234s | Good | Good | Good | Normal Sinus Rhythm | 45  |
| t234s | Good | Good | Good | Normal Sinus Rhythm | 60  |
| t234s | Good | Good | Good | Normal Sinus Rhythm | 75  |
| t234s | Good | Good | Good | Normal Sinus Rhythm | 15  |
| t235l | Good | Good | Good | Extreme Tachycardia | 300 | 292 | 300 |
| t235l | Good | Good | Good | Normal Sinus Rhythm | 135 |
| t235l | Good | Good | Good | Normal Sinus Rhythm | 30  |
| t235l | Good | Good | Good | Normal Sinus Rhythm | 45  |
| t235l | Good | Good | Good | Normal Sinus Rhythm | 60  |
| t235l | Good | Good | Good | Normal Sinus Rhythm | 75  |
| t238s | Good | Good | Good | Extreme Tachycardia | 300 | 290.5 | 300 |
| t240s | Good | Good | Good | Extreme Tachycardia | 299 | 291 | 300 |
| t240s | Good | Good | Good | Normal Sinus Rhythm | 135 |
| t240s | Good | Good | Good | Normal Sinus Rhythm | 30  |
| t240s | Good | Good | Good | Normal Sinus Rhythm | 45  |
| t240s | Good | Good | Good | Normal Sinus Rhythm | 60  |
| t240s | Good | Good | Good | Normal Sinus Rhythm | 75  |
| t240s | Good | Good | Good | Normal Sinus Rhythm | 90  |
| t240s | Good | Good | Good | Normal Sinus Rhythm | 15  |
| t249l | Good | Good | Good | Extreme Tachycardia | 300 | 290 | 300 |
| t251l | Good | Good | Good | Extreme Tachycardia | 300 | 291.5 | 300 |
| t252s | Good | Good | Good | Extreme Tachycardia | 300 | 285.5 | 300 |
| t263l | Bad  | Bad  | Bad  | Noise/artifacts   | 300 |
| t264s | Good | Good | Good | Extreme Tachycardia | 300 | 292 | 300 |
| t270s | Good | Good | Good | Extreme Tachycardia | 300 | 292.7 | 300 |
| t276s | Good | Good | Good | Extreme Tachycardia | 300 | 292 | 300 |
| Patient | Status 1 | Status 2 | Status 3 | Diagnosis                       | Rate 1 | Rate 2 | Rate 3 |
|---------|----------|----------|----------|---------------------------------|--------|--------|--------|
| t277l   | Good     | Good     | Good     | Extreme Tachycardia             | 300    | 291.5  | 300    |
| t277l   | Good     | Good     | Good     | Normal Sinus Rhythm             | 135    |         |        |
| t277l   | Good     | Good     | Good     | Extreme Tachycardia             | 30     | 18.6   | 26     |
| t277l   | Good     | Good     | Good     | Normal Sinus Rhythm             | 45     |         |        |
| t277l   | Good     | Good     | Good     | Normal Sinus Rhythm             | 60     |         |        |
| t277l   | Good     | Good     | Good     | Normal Sinus Rhythm             | 75     |         |        |
| t277l   | Good     | Good     | Good     | Normal Sinus Rhythm             | 90     |         |        |
| t277l   | Good     | Good     | Good     | Normal Sinus Rhythm             | 15     |         |        |
| t284s   | Good     | Good     | Bad      | Extreme Tachycardia             | 300    | 291    | 300    |
| t300s   | Good     | Good     | Bad      | Extreme Tachycardia             | 300    | 287.8  | 300    |
| t305l   | Good     | Good     | Bad      | Extreme Tachycardia             | 300    | 291.2  | 300    |
| t320s   | Bad      | Good     | Bad      | PVCs                            | 300    |         |        |
| t333l   | Good     | Good     | Good     | Extreme Tachycardia             | 300    | 292.5  | 300    |
| t333l   | Good     | Good     | Good     | Normal Sinus Rhythm             | 135    | 292    | 299    |
| t335l   | Good     | Good     | Good     | Extreme Tachycardia             | 300    | 292.1  | 299.5  |
| t342s   | Good     | Good     | Good     | Extreme Tachycardia             | 300    | 290.2  | 300    |
| t342s   | Good     | Good     | Good     | Extreme Tachycardia             | 135    | 120.5  | 129.7  |
| t343l   | Good     | Good     | Bad      | Extreme Tachycardia             | 300    | 292.3  | 300    |
| t344s   | Good     | Good     | Good     | Extreme Tachycardia             | 300    | 289.7  | 300    |
| t350s   | Good     | Good     | Good     | Extreme Tachycardia             | 300    | 292    | 300    |
| t351l   | Good     | Good     | Good     | Extreme Tachycardia             | 300    | 292    | 300    |
| t356s   | Good     | Good     | Good     | Extreme Tachycardia             | 300    | 292.5  | 300    |
| t357l   | Good     | Good     | Good     | Normal Sinus Rhythm             | 300    |         |        |
| t358s   | Good     | Good     | Bad      | Extreme Tachycardia             | 300    | 289    | 300    |
| t383l   | Good     | Good     | Good     | Paced                           | 300    |         |        |
| t383l   | Good     | Good     | Good     | Normal Sinus Rhythm             | 135    |         |        |
| t383l   | Good     | Good     | Good     | Normal Sinus Rhythm             | 15     |         |        |
| t384s   | Good     | Good     | Good     | Paced                           | 300    |         |        |
| TID   | Annotation 1 | Annotation 2 | Annotation 3 | Annotation 4 | Rhythm                | RRi  | RRm  | RRm  |
|-------|--------------|--------------|--------------|--------------|-----------------------|------|------|------|
| t393l | Good         | Good         | Bad          |               | Extreme Tachycardia    | 300  | 285  | 300  |
| t394s | Good         | Good         | Good         |               | Extreme Tachycardia    | 300  | 285  | 300  |
| t406s | Good         | Good         | Good         | Good         | Extreme Tachycardia    | 300  | 285.5| 300  |
| t409l | Bad          | Bad          | Good         | Good         | Inconclusive           | 300  |      |      |
| t410s | Good         | Good         | Bad          |              | Extreme Tachycardia    | 300  | 285  | 300  |
| t411l | Good         | Good         | Bad          |              | Extreme Tachycardia    | 300  | 285  | 300  |
| t412s | Good         | Good         | Good         |              | Extreme Tachycardia    | 300  | 290  | 298.5|
| t413l | Good         | Good         | Good         |              | Extreme Tachycardia    | 300  | 288.2| 300  |
| t416s | Good         | Good         | Good         |              | Normal Sinus Rhythm    | 300  |      |      |
| t417l | Good         | Good         | Good         |              | Extreme Tachycardia    | 300  | 292  | 300  |
| t417l | Good         | Good         | Good         |              | Normal Sinus Rhythm    | 135  |      |      |
| t417l | Good         | Good         | Good         |              | Normal Sinus Rhythm    | 15   |      |      |
| t418s | Good         | Good         | Good         |              | Normal Sinus Rhythm    | 300  |      |      |
| t418s | Good         | Good         | Good         |              | Normal Sinus Rhythm    | 135  |      |      |
| t424s | Good         | Good         | Good         |              | Normal Sinus Rhythm    | 300  |      |      |
| t425l | Good         | Good         | Bad          |              | Normal Sinus Rhythm    | 300  |      |      |
| t430s | Good         | Good         | Bad          |              | Extreme Tachycardia    | 300  | 285  | 300  |
| t434s | Good         | Good         | Good         |              | Extreme Tachycardia    | 300  | 285  | 300  |
| t444s | Good         | Good         | Good         |              | Extreme Tachycardia    | 294  | 285  | 294  |
| t445l | Good         | Good         | Bad          |              | Extreme Tachycardia    | 296  | 285  | 296  |
| t447l | Good         | Good         | Good         |              | Extreme Tachycardia    | 298  | 285  | 298  |
| t458s | Good         | Good         | Good         |              | Extreme Tachycardia    | 298  | 289  | 298  |
| t467l | Good         | Bad          | Bad          |              | Noise/artifacts        | 300  |      |      |
| t468s | Good         | Good         | Good         |              | Extreme Tachycardia    | 300  | 291.4| 300  |
| t469l | Good         | Good         | Good         |              | Normal Sinus Rhythm    | 300  |      |      |
| t469l | Good         | Good         | Good         |              | Normal Sinus Rhythm    | 135  |      |      |
| t477l | Good         | Good         | Bad          |              | PVCs                  | 300  |      |      |
| t478s | Good         | Good         | Good         |              | Normal Sinus Rhythm    | 300  |      |      |
| Time  | QRS  | ST  | RR  | Diagnosis                     | Heart Rate | Rate |
|-------|------|-----|-----|-------------------------------|------------|------|
| t478s | Good | Good| Good| Normal Sinus Rhythm           | 135        |      |
| t478s | Good | Good| Good| Normal Sinus Rhythm           | 15         |      |
| t496s | Good | Good| Good| Normal Sinus Rhythm           | 300        |      |
| t503l | Bad  | Bad | Bad | Noise/artifacts               | 300        |      |
| t504s | Bad  | Bad | Bad | Noise/artifacts               | 300        |      |
| t506s | Good | Bad | Bad | Noise/artifacts               | 300        | 291.7|
| t507l | Good | Bad | Bad | Normal Sinus Rhythm           | 292        |      |
| t508s | Good | Good| Bad | Extreme Tachycardia           | 300        | 290  |
| t509l | Good | Good| Good| Extreme Tachycardia           | 300        | 291.5|
| t520s | Bad  | Bad | Bad | Noise/artifacts               | 300        |      |
| t521l | Good | Good| Bad | Bundle branch block           | 300        | 285  |
| t524s | Good | Good| Bad | PVCs                          | 300        | 285  |
| t546s | Bad  | Good| Good| Noise/artifacts               | 300        | 285  |
| t547l | Bad  | Good| Good| Extreme Tachycardia           | 300        | 285  |
| t565l | Good | Good| Good| Extreme Tachycardia           | 300        | 290.9|
| t565l | Good | Good| Good| Normal Sinus Rhythm           | 135        |      |
| t565l | Good | Good| Good| Normal Sinus Rhythm           | 15         |      |
| t567l | Good | Good| Good| Extreme Tachycardia           | 300        | 290.5|
| t577l | Good | Good| Good| Extreme Tachycardia           | 300        | 291.7|
| t577l | Good | Good| Good| Normal Sinus Rhythm           | 15         |      |
| t580s | Bad  | Good| Bad | PVCs                          | 300        |      |
| t589l | Good | Good| Good| PVCs                          | 300        | 285  |
| t594s | Good | Good| Good| Extreme Tachycardia           | 300        | 292.9|
| t594s | Good | Good| Good| Normal Sinus Rhythm           | 135        |      |
| t595l | Bad  | Good| Bad | Extreme Tachycardia           | 300        | 292.6|
| t614s | Good | Good| Good| Normal Sinus Rhythm           | 300        |      |
| t622s | Good | Good| Bad | Extreme Tachycardia           | 300        | 291.2|
| t662s | Good | Good| Good| Extreme Tachycardia           | 300        | 287.6|
| Time  | Quality | Reference | Rhythm               | Rate 1 | Rate 2 | Rate 3 |
|-------|---------|-----------|----------------------|--------|--------|--------|
| t662s | Good    | Good      | Good                 | Normal Sinus Rhythm | 135    |        |
| t662s | Good    | Good      | Good                 | PVCs   | 15     |        |
| t665l | Good    | Good      | Good                 | Extreme Tachycardia | 300    | 285    | 300    |
| t677l | Good    | Good      | Good                 | Extreme Tachycardia | 300    | 292.1  | 300    |
| t677l | Good    | Good      | Good                 | Normal Sinus Rhythm | 135    |        |        |
| t678s | Bad     | Good      | Good                 | Noise/artifacts   | 300    |        |        |
| t679l | Good    | Good      | Good                 | Extreme Tachycardia | 299    | 291.6  | 299    |
| t680s | Good    | Good      | Good                 | Extreme Tachycardia | 300    | 291.8  | 300    |
| t683l | Good    | Bad       | VT                   | 300    | 293.4  | 300    |
| t688s | Good    | Bad       | Extreme Tachycardia  | 300    | 285    | 300    |
| t689l | Good    | Good      | Good                 | Paced   | 300    |        |        |
| t690s | Good    | Good      | Good                 | Extreme Tachycardia | 300    | 288.4  | 300    |
| t693l | Good    | Good      | Good                 | Extreme Tachycardia | 300    | 285.5  | 300    |
| t698s | Good    | Good      | Good                 | Extreme Tachycardia | 300    | 285    | 300    |
| t700s | Good    | Good      | Good                 | PVCs    | 300    |        |        |
| t702s | Good    | Good      | Good                 | Extreme Tachycardia | 298.5  | 290.8  | 298.5  |
| t702s | Good    | Good      | Good                 | Normal Sinus Rhythm | 15     |        |        |
| t707l | Good    | Good      | Good                 | Paced   | 299.5  |        |        |
| t709l | Good    | Good      | Good                 | Extreme Tachycardia | 299.5  | 290.1  | 299.5  |
| t716s | Good    | Good      | Good                 | Extreme Tachycardia | 299.5  | 291.8  | 299.5  |
| t717l | Bad     | Good      | Bad                  | Noise/artifacts  | 300    |        |        |
| t719l | Bad     | Good      | Good                 | Bundle branch block | 300    |        |        |
| t731l | Good    | Good      | Good                 | Normal Sinus Rhythm | 300    |        |        |
| t737l | Good    | Good      | Good                 | Extreme Tachycardia | 299.5  | 291.3  | 299.5  |
| t739l | Good    | Good      | Good                 | PVCs    | 300    |        |        |
| t741l | Good    | Good      | Good                 | Extreme Tachycardia | 299.5  | 292    | 299.5  |
| t742s | Bad     | Good      | Bad                  | PVCs    | 294    |        |        |
| t744s | Good    | Good      | Good                 | Extreme Tachycardia | 300    | 289.4  | 300    |
| Time  | Quality | Interpretation       | Heart Rate 1 | Heart Rate 2 | Heart Rate 3 |
|-------|---------|----------------------|--------------|--------------|--------------|
| t745l | Bad     | Good                 | Bad          | Extreme Tachycardia | 298.5 | 291 | 298.5 |
| t747l | Good    | Good                 | Good         | Extreme Tachycardia | 300   | 292.4 | 300   |
| t752s | Good    | Good                 | Good         | Extreme Tachycardia | 300   | 291.8 | 300   |
| t752s | Good    | Good                 | Good         | Normal Sinus Rhythm | 135   |       |       |
| t755l | Good    | Bad                  | Extreme Tachycardia | 299 | 288.9 | 299   |
| t760s | Good    | Good                 | Good         | Extreme Tachycardia | 300   | 291.8 | 300   |
| t762s | Good    | Bad                  | Extreme Tachycardia | 300 | 292.6 | 300   |
| t771l | Good    | Bad                  | Bundle branch block | 300 |       |       |
| t777l | Good    | Good                 | Good         | ST elevation      | 299.5 | 291.3 | 300   |
| t786s | Good    | Bad                  | Extreme Tachycardia | 298.5 | 291.2 | 298.5 |
| t787l | Good    | Good                 | Good         | Normal Sinus Rhythm | 300   |       |       |
| t790s | Good    | Bad                  | Extreme Tachycardia | 300 | 292.5 | 300   |
| t800s | Good    | Good                 | Good         | Extreme Tachycardia | 300   | 285 | 300   |
| t801l | Good    | Bad                  | Extreme Tachycardia | 300 | 290.8 | 298.3 |
| t812s | Good    | Good                 | Good         | Extreme Tachycardia | 300   | 289.9 | 300   |
| t816s | Good    | Good                 | Bad          | Extreme Tachycardia | 300   | 285 | 300   |
| t817l | Good    | Good                 | Good         | ST elevation      | 300   |       |       |
| t821l | Good    | Bad                  | Extreme Tachycardia | 300 | 292.4 | 300   |
| v100s | Good    | Bad                  | Normal Sinus Rhythm | 300 |       |       |
| v101l | Good    | Bad                  | Normal Sinus Rhythm | 300 |       |       |
| v102s | Good    | Bad                  | Normal Sinus Rhythm | 300 |       |       |
| v111l | Good    | Good                 | Good         | Normal Sinus Rhythm | 300   |       |       |
| v113l | Bad     | Bad                  | Bad          | Noise/artifacts   | 300   |       |       |
| v115l | Bad     | Bad                  | Good         | Noise/artifacts   | 300   |       |       |
| v119l | Good    | Good                 | Bad          | VT                | 300   | 296.2 | 300   |
| v122s | Good    | Bad                  | Bad          | VT                | 300   | 293.6 | 300   |
| v127l | Bad     | Bad                  | Bad          | Noise/artifacts   | 300   |       |       |
| v128s | Bad | Bad | Bad | Noise/artifacts | 300 |
|-------|-----|-----|-----|-----------------|-----|
| v131l | Good | Good | Good | VT              | 299 |
| v132s | Good | Good | Good | VT              | 299 |
| v132s | Good | Good | Good | VT              | 299 |
| v133l | Good | Good | Good | Normal Sinus Rhythm | 135 |
| v135l | Good | Good | Good | Normal Sinus Rhythm | 300 |
| v136s | Good | Good | Good | VT              | 300 |
| v139l | Good | Good | Good | Normal Sinus Rhythm | 298 |
| v140s | Good | Good | Good | Extreme Tachycardia | 300 |
| v141l | Bad | Bad | Bad | Noise/artifacts | 300 |
| v143l | Good | Good | Bad | Inconclusive | 300 |
| v146s | Good | Good | Good | VT              | 300 |
| v147l | Bad | Bad | Bad | Noise/artifacts | 300 |
| v148s | Bad | Bad | Bad | Noise/artifacts | 300 |
| v153l | Good | Bad | Good | Normal Sinus Rhythm | 300 |
| v154s | Good | Bad | Good | Normal Sinus Rhythm | 300 |
| v155l | Good | Bad | Good | Normal Sinus Rhythm | 300 |
| v158s | Good | Good | Good | VT              | 300 |
| v159l | Good | Good | Good | Bundle branch block | 300 |
| v160s | Good | Good | Good | PVCs           | 300 |
| v162s | Good | Good | Good | NSVT           | 300 |
| v164s | Good | Good | Good | Normal Sinus Rhythm | 300 |
| v166s | Good | Good | Good | Normal Sinus Rhythm | 300 |
| v168s | Good | Good | Good | Normal Sinus Rhythm | 300 |
| v169l | Good | Bad | Bad | Noise/artifacts | 300 |
| v176s | Bad | Bad | Good | Noise/artifacts | 300 |
| v177l | Good | Good | Good | Normal Sinus Rhythm | 300 |
| v179l | Good | Bad | Good | Normal Sinus Rhythm | 300 |
| v180s | Good | Good | Good | Good | Normal Sinus Rhythm | 300 |      |
|-------|------|------|------|------|---------------------|----|------|
| v181l | Bad  | Good | Bad  | Bad  | Normal Sinus Rhythm | 300 |      |
| v182s | Good | Good | Bad  | Good | Normal Sinus Rhythm | 300 |      |
| v188s | Good | Good | Good | CPR  | 300 285 300         |    |      |
| v194s | Good | Good | Good | VT   | 298.5 296.5 298.5   |    |      |
| v194s | Good | Good | Good | Normal Sinus Rhythm | 135 |      |
| v197l | Good | Good | Good | VT   | 299 295.7 299       |    |      |
| v197l | Good | Good | Good | Normal Sinus Rhythm | 135 |      |
| v198s | Bad  | Good | Good | Noise/artifacts | 300 |      |
| v199l | Good | Good | Good | VT   | 298.5 295.5 298.3   |    |      |
| v199l | Good | Good | Good | Normal Sinus Rhythm | 135 |      |
| v200s | Bad  | Bad  | Good | Good | Noise/artifacts | 300 |      |
| v201l | Good | Good | Good | Good | PVCs 300            |    |      |
| v201l | Good | Good | Good | Good | PVCs 15             |    |      |
| v202s | Bad  | Bad  | Good | Bad  | Noise/artifacts | 300 |      |
| v204s | Bad  | Bad  | Bad  | Noise/artifacts | 300 |      |
| v205l | Bad  | Good | Good | Bad  | Noise/artifacts | 300 |      |
| v206s | Good | Good | Good | Good | VT 289 286.7 289    |    |      |
| v206s | Good | Good | Good | Normal Sinus Rhythm | 135 |      |
| v207l | Bad  | Bad  | Good | Noise/artifacts | 300 |      |
| v210s | Good | Good | Good | Normal Sinus Rhythm | 300 |      |
| v210s | Good | Good | Good | Normal Sinus Rhythm | 135 |      |
| v210s | Good | Good | Good | Normal Sinus Rhythm | 15  |      |
| v210s | Good | Good | Good | Normal Sinus Rhythm | 120 |      |
| v210s | Good | Good | Good | Normal Sinus Rhythm | 135 |      |
| v210s | Good | Good | Good | Normal Sinus Rhythm | 30  |      |
| v210s | Good | Good | Good | Normal Sinus Rhythm | 285 |      |
| v210s | Good | Good | Good | Normal Sinus Rhythm | 45  |      |
| v210s | Good | Good | Good | Normal Sinus Rhythm | 60 |
|-------|------|------|------|---------------------|----|
| v210s | Good | Good | Good | Normal Sinus Rhythm | 75 |
| v210s | Good | Good | Good | Normal Sinus Rhythm | 90 |
| v210s | Good | Good | Good | Normal Sinus Rhythm | 105|
| v211l | Good | Good | Good | Normal Sinus Rhythm | 300|
| v212s | Bad  | Good | Good | Noise/artifacts     | 300|
| v217l | Bad  | Bad  | Good | Noise/artifacts     | 300|
| v218s | Bad  | Bad  | Bad  | Good                | 300|
| v221l | Good | Good | Good | VT                  | 295.5 | 292.9 | 295.8 |
| v222s | Bad  | Good | Good | PVCs                | 300 |
| v224s | Good | Good | Good | PVCs                | 300 |
| v230s | Bad  | Bad  | Bad  | Good                | 300 |
| v232s | Bad  | Bad  | Bad  | Bad                 | 300 |
| v233l | Bad  | Bad  | Bad  | Good                | 300 |
| v241l | Bad  | Bad  | Good | Good                | 300 |
| v242s | Bad  | Bad  | Good | Noise/artifacts     | 300 |
| v243l | Bad  | Bad  | Bad  | Noise/artifacts     | 300 |
| v244s | Bad  | Good | Good | Normal Sinus Rhythm | 300 |
| v245l | Bad  | Bad  | Good | Noise/artifacts     | 300 |
| v246s | Good | Good | Good | Normal Sinus Rhythm | 300 |
| v247l | Bad  | Bad  | Good | Noise/artifacts     | 300 |
| v248s | Bad  | Bad  | Good | Noise/artifacts     | 300 |
| v250s | Bad  | Bad  | Good | Noise/artifacts     | 300 |
| v253l | Good | Good | Good | VT                  | 294 | 291.3 | 293.8 |
| v253l | Good | Good | Good | PVCs                | 135 |
| v253l | Good | Good | Good | PVCs                | 150 |
| v253l | Good | Good | Good | PVCs                | 195 |
| v253l | Good | Good | Good | PVCs                | 210 |
| File | Status | Status | Status | Status | Observations | Rate (bpm) | Rate (bpm) | Rate (bpm) |
|------|--------|--------|--------|--------|--------------|-----------|-----------|-----------|
| v253l | Good   | Good   | Good   | Good   | PVCs         | 255       |           |           |
| v253l | Good   | Good   | Good   | Good   | PVCs         | 270       |           |           |
| v253l | Good   | Good   | Good   | Good   | PVCs         | 60        |           |           |
| v253l | Good   | Good   | Good   | Good   | PVCs         | 75        |           |           |
| v253l | Good   | Good   | Good   | Good   | PVCs         | 105       |           |           |
| v254s | Good   | Good   | Good   | Good   | VT           | 292       | 288.9     | 291.8     |
| v254s | Good   | Good   | Good   | Good   | PVCs         | 135       |           |           |
| v254s | Good   | Good   | Good   | Good   | Normal Sinus Rhythm | 15   |           |           |
| v254s | Good   | Good   | Good   | Good   | PVCs         | 135       |           |           |
| v254s | Good   | Good   | Good   | Good   | PVCs         | 150       |           |           |
| v254s | Good   | Good   | Good   | Good   | PVCs         | 30        |           |           |
| v254s | Good   | Good   | Good   | Good   | PVCs         | 45        |           |           |
| v254s | Good   | Good   | Good   | Good   | PVCs         | 60        |           |           |
| v254s | Good   | Good   | Good   | Good   | PVCs         | 105       |           |           |
| v255l | Good   | Good   | Good   | Good   | VT           | 296       | 291.5     | 296       |
| v255l | Good   | Good   | Good   | Good   | PVCs         | 135       |           |           |
| v256s | Good   | Good   | Good   | Good   | Normal Sinus Rhythm | 300   |           |           |
| v257l | Good   | Good   | Good   | Good   | Normal Sinus Rhythm | 300   |           |           |
| v258s | Good   | Good   | Bad    |        | Bundle branch block | 300 |           |           |
| v259l | Good   | Good   | Bad    |        | Bundle branch block | 300 |           |           |
| v262s | Good   | Bad    | Bad    |        | Noise/artifacts  | 300       |           |           |
| v271l | Good   | Good   | Good   |        | Normal Sinus Rhythm | 300   |           |           |
| v274s | Good   | Bad    | Good   |        | Noise/artifacts  | 300       |           |           |
| v274s | Good   | Good   | Good   |        | Normal Sinus Rhythm | 135   |           |           |
| v275l | Good   | Bad    | Good   |        | NSVT        | 295       | 291.8     | 295.2     |
| v280s | Good   | Good   | Bad    |        | PVCs         | 300       |           |           |
| v282s | Good   | Good   | Bad    |        | Normal Sinus Rhythm | 300 |           |           |
| v283l | Good   | Bad    | Good   |        | Noise/artifacts  | 300       |           |           |
| ID   | Quality | Channel 1 | Channel 2 | Channel 3 | Rhythm                      | Rate |
|------|---------|-----------|-----------|-----------|-----------------------------|------|
| v283l| Good    | Good      | Good      | Normal Sinus Rhythm | 135                          |
| v283l| Good    | Good      | Good      | Normal Sinus Rhythm | 15                           |
| v289l| Bad     | Good      | Good      | Normal Sinus Rhythm | 300                          |
| v290s| Good    | Good      | Good      | VT         | 300                          |
| v291l| Good    | Good      | Good      | Normal Sinus Rhythm | 300                          |
| v292s| Good    | Good      | Good      | Normal Sinus Rhythm | 300                          |
| v292s| Good    | Good      | Good      | Normal Sinus Rhythm | 135                          |
| v292s| Good    | Good      | Good      | Normal Sinus Rhythm | 15                           |
| v293l| Good    | Good      | Good      | Normal Sinus Rhythm | 300                          |
| v294s| Bad     | Bad       | Good      | Noise/artifacts | 300                          |
| v295l| Bad     | Bad       | Good      | Noise/artifacts | 300                          |
| v296s| Bad     | Bad       | Good      | Noise/artifacts | 300                          |
| v298s| Bad     | Bad       | Good      | Noise/artifacts | 300                          |
| v303l| Good    | Good      | Good      | Extreme Tachycardia | 300                          |
| v307l| Bad     | Bad       | Bad       | Noise/artifacts | 300                          |
| v309l| Good    | Good      | Good      | VT         | 297.5  | 294.5  | 297.5  |
| v309l| Good    | Good      | Good      | Normal Sinus Rhythm | 135                          |
| v312s| Good    | Good      | Good      | Normal Sinus Rhythm | 300                          |
| v316s| Good    | Good      | Good      | Normal Sinus Rhythm | 300                          |
| v316s| Good    | Good      | Good      | Normal Sinus Rhythm | 135                          |
| v316s| Good    | Good      | Good      | Normal Sinus Rhythm | 15                           |
| v317l| Bad     | Good      | Good      | Noise/artifacts | 300                          |
| v318s| Good    | Good      | Bad       | VT         | 295    | 291    | 295    |
| v319l| Bad     | Bad       | Good      | Noise/artifacts | 300                          |
| v322s| Good    | Good      | Bad       | PVCs       | 300                          |
| v323l| Good    | Good      | Bad       | PVCs       | 300                          |
| v323l| Good    | Good      | Good      | Normal Sinus Rhythm | 135                          |
| v324s| Good    | Bad       | Good      | Noise/artifacts | 300                          |
| File  | Quality | Signal Quality | Conditions | Notes | Duration |
|-------|---------|----------------|------------|-------|----------|
| v325l | Good    | Bad            | Good       | Noise/artifacts | 300      |
| v326s | Good    | Bad            | Good       | Normal Sinus Rhythm | 300      |
| v327l | Good    | Good           | Good       | PVCs  | 300      |
|       | Good    | Good           | Good       | Normal Sinus Rhythm | 135      |
| v327l | Good    | Good           | Good       | PVCs  | 15       |
| v328s | Good    | Good           | Good       | PVCs  | 300      |
| v329l | Good    | Good           | Good       | Paced | 298      |
| v334s | Good    | Good           | Good       | VT    | 300      |
|       | Good    | Good           | Good       | Normal Sinus Rhythm | 135      |
| v334s | Good    | Good           | Good       | Normal Sinus Rhythm | 15       |
| v336s | Good    | Bad            | Bad        | Noise/artifacts | 300      |
| v337l | Good    | Bad            | Bad        | Noise/artifacts | 300      |
| v338s | Good    | Bad            | Bad        | Noise/artifacts | 300      |
| v338s | Good    | Good           | Good       | Normal Sinus Rhythm | 15       |
| v347l | Good    | Bad            | Bad        | Noise/artifacts | 300      |
| v348s | Good    | Good           | Bad        | VT    | 300      |
|       | Good    | Good           | Bad        | Normal Sinus Rhythm | 300      |
| v353l | Good    | Bad            | Good       | PVCs  | 300      |
| v354s | Good    | Good           | Good       | Normal Sinus Rhythm | 300      |
| v355l | Bad     | Bad            | Good       | Noise/artifacts | 300      |
| v359l | Bad     | Good           | Good       | Noise/artifacts | 300      |
| v359l | Good    | Good           | Good       | Normal Sinus Rhythm | 135      |
| v359l | Good    | Good           | Good       | Normal Sinus Rhythm | 15       |
| v360s | Bad     | Bad            | Good       | Noise/artifacts | 300      |
| v361l | Bad     | Bad            | Good       | Noise/artifacts | 300      |
| v364s | Bad     | Bad            | Good       | Noise/artifacts | 300      |
| v365l | Good    | Good           | Bad        | Normal Sinus Rhythm | 300      |
| v366s | Good    | Bad            | Good       | Noise/artifacts | 300      |
| v367l | Good    | Bad            | Bad        | Noise/artifacts | 300      |
|   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|
| v432s | Bad | Bad | Bad | Good | Noise/artifacts | 300 |
| v433l | Good | Good | Good | Normal Sinus Rhythm | 300 |
| v437l | Good | Bad | Good | Bad | Noise/artifacts | 300 |
| v438s | Good | Bad | Good | Noise/artifacts | 300 |
| v448s | Bad | Bad | Bad | Noise/artifacts | 298 |
| v452s | Bad | Bad | Good | Noise/artifacts | 300 |
| v453l | Good | Bad | Good | Noise/artifacts | 300 |
| v454s | Good | Bad | Good | Noise/artifacts | 300 |
| v459l | Good | Bad | Good | Noise/artifacts | 300 |
| v460s | Bad | Bad | Good | Bad | Noise/artifacts | 300 |
| v463l | Bad | Bad | Bad | Noise/artifacts | 300 |
| v464s | Good | Bad | Good | Good | PVCs | 300 |
| v466s | Bad | Bad | Bad | Bad | Noise/artifacts | 300 |
| v470s | Bad | Bad | Bad | Noise/artifacts | 300 |
| v471l | Good | Good | Good | Good | VT | 300 | 297.8 | 300 |
| v472s | Bad | Bad | Bad | Bad | Noise/artifacts | 300 |
| v473l | Good | Good | Bad | Good | Normal Sinus Rhythm | 300 |
| v475l | Bad | Bad | Bad | Noise/artifacts | 300 |
| v476s | Bad | Bad | Good | Noise/artifacts | 300 |
| v479l | Bad | Bad | Good | Noise/artifacts | 300 |
| v480s | Bad | Bad | Good | Noise/artifacts | 300 |
| v481l | Good | Good | Good | Good | Bundle branch block | 300 |
| v482s | Good | Good | Bad | Good | Bundle branch block | 300 |
| v483l | Good | Good | Good | Good | Bundle branch block | 300 |
| v489l | Bad | Bad | Good | Bad | Noise/artifacts | 300 |
| v491l | Bad | Bad | Good | Bad | Noise/artifacts | 300 |
| v492s | Bad | Bad | Bad | Bad | Noise/artifacts | 300 |
| v498s | Good | Bad | Bad | Good | Noise/artifacts | 300 |
| v501l | Good | Bad | Good | Good | Noise/artifacts | 300 |
|------|------|-----|------|------|-----------------|-----|
| v502s| Good | Bad | Good | Good | Noise/artifacts | 300 |
| v505l| Good | Good | Bad  |      | Normal Sinus Rhythm | 300 |
| v510s| Bad  | Good | Good |      | Normal Sinus Rhythm | 300 |
| v511l| Bad  | Bad  | Good |      | Noise/artifacts   | 300 |
| v513l| Bad  | Good | Good |      | Noise/artifacts   | 300 |
| v513l| Good | Good | Good |      | Normal Sinus Rhythm | 135 |
| v513l| Good | Good | Good |      | Normal Sinus Rhythm | 15 |
| v518s| Bad  | Bad  | Good | Good | Noise/artifacts | 300 |
| v519l| Good | Bad  | Good | Good | Noise/artifacts | 300 |
| v522s| Good | Good | Good |      | VT              | 300 | 290.8 | 299.2 |
| v522s| Good | Good | Good |      | Normal Sinus Rhythm | 135 |
| v522s| Good | Good | Good |      | Normal Sinus Rhythm | 15 |
| v523l| Good | Good | Good |      | VT              | 300 | 286.9 | 291.7 |
| v525l| Good | Good | Good |      | VT              | 299 | 296.7 | 299 |
| v531l| Bad  | Bad  | Bad  | Bad  | Noise/artifacts | 300 |
| v532s| Good | Good | Good |      | PVCs            | 300 |
| v533l| Good | Good | Good |      | PVCs            | 300 |
| v534s| Good | Good | Good |      | Normal Sinus Rhythm | 300 |
| v535l| Bad  | Bad  | Bad  | Good | Noise/artifacts | 300 |
| v536s| Bad  | Bad  | Bad  | Good | Noise/artifacts | 300 |
| v540s| Good | Good | Bad  | Bad  | VF              | 217 | 212  | 217 |
| v541l| Good | Good | Good | Bad  | VF              | 300 | 295.9 | 300 |
| v541l| Good | Good | Good | Good | Normal Sinus Rhythm | 135 |
| v542s| Good | Good | Good |      | VT              | 300 | 289.7 | 293 |
| v548s| Good | Good | Good |      | Normal Sinus Rhythm | 300 |
| v549l| Good | Good | Good |      | Normal Sinus Rhythm | 300 |
| v551l| Bad  | Bad  | Good | Bad  | Noise/artifacts | 300 |
| v552s | Good | Bad | Good | Bad | Noise/artifacts | 300 |
| v557l | Good | Good | Good | Good | Normal Sinus Rhythm | 300 |
| v557l | Good | Good | Good | Good | Normal Sinus Rhythm | 135 |
| v557l | Good | Good | Good | Good | Normal Sinus Rhythm | 15 |
| v559l | Good | Good | Good | Good | PVCs | 300 |
| v564s | Good | Good | Good | Good | VT | 300 | 296.5 | 300 |
| v566s | Bad | Bad | Bad | Bad | Noise/artifacts | 300 |
| v568s | Bad | Bad | Good | Good | Noise/artifacts | 300 |
| v569l | Bad | Good | Good | Good | Noise/artifacts | 300 |
| v570s | Bad | Bad | Bad | Bad | Noise/artifacts | 300 |
| v571l | Good | Good | Good | Good | VT | 298 | 295.8 | 298 |
| v573l | Good | Good | Good | Good | VT | 295.5 | 289.5 | 295.5 |
| v573l | Good | Good | Good | Good | Normal Sinus Rhythm | 135 |
| v573l | Good | Good | Good | Good | Normal Sinus Rhythm | 15 |
| v574s | Good | Good | Good | Good | VT | 298.5 | 296.1 | 298.5 |
| v574s | Good | Good | Good | Good | Normal Sinus Rhythm | 135 |
| v574s | Good | Good | Good | Good | Normal Sinus Rhythm | 15 |
| v575l | Good | Good | Good | Good | Bundle branch block | 300 |
| v579l | Good | Good | Good | Good | VT | 299.5 | 297 | 299.5 |
| v579l | Good | Good | Good | Good | Normal Sinus Rhythm | 135 |
| v581l | Good | Good | Good | Good | Normal Sinus Rhythm | 300 |
| v583l | Good | Bad | Bad | Good | Noise/artifacts | 300 |
| v585l | Bad | Bad | Good | Good | Paced | 300 |
| v590s | Bad | Bad | Good | Good | Noise/artifacts | 300 |
| v596s | Good | Good | Good | Good | Paced | 300 |
| v597l | Good | Good | Good | Good | VT | 298.5 | 295.4 | 298.5 |
| v598s | Good | Good | Good | Good | VT | 300 | 293.5 | 297.3 |
| v601l | Bad | Good | Good | Good | Noise/artifacts | 300 |
| Patient | Quality | Quality | Quality | Rhythm          | Rate  |
|---------|---------|---------|---------|----------------|-------|
| v601l   | Good    | Good    | Good    | Normal Sinus Rhythm | 135   |
| v601l   | Good    | Good    | Good    | Normal Sinus Rhythm | 15    |
| v607l   | Good    | Good    | Good    | VT             | 298   |
| v607l   | Good    | Good    | Good    | Normal Sinus Rhythm | 135   |
| v607l   | Good    | Good    | Good    | Normal Sinus Rhythm | 15    |
| v609l   | Bad     | Bad     | Bad     | Noise/artifacts | 300   |
| v611l   | Bad     | Bad     | Good    | Noise/artifacts | 300   |
| v612s   | Bad     | Bad     | Good    | Noise/artifacts | 300   |
| v615l   | Good    | Good    | Good    | Paced          | 300   |
| v616s   | Good    | Bad     | Bad     | PVCs           | 300   |
| v619l   | Good    | Good    | Good    | VT             | 300   |
| v620s   | Good    | Good    | Good    | Normal Sinus Rhythm | 300   |
| v621l   | Bad     | Bad     | Bad     | Noise/artifacts | 300   |
| v623l   | Bad     | Bad     | Good    | Noise/artifacts | 300   |
| v625l   | Good    | Good    | Good    | VT             | 298   |
| v625l   | Good    | Good    | Good    | Normal Sinus Rhythm | 135   |
| v626s   | Good    | Good    | Good    | VT             | 300   |
| v627l   | Bad     | Bad     | Bad     | Noise/artifacts | 300   |
| v628s   | Good    | Good    | Good    | VT             | 298   |
| v629l   | Good    | Good    | Good    | PVCs           | 300   |
| v630s   | Good    | Good    | Good    | VT             | 300   |
| v630s   | Good    | Good    | Good    | Normal Sinus Rhythm | 135   |
| v630s   | Good    | Good    | Good    | Normal Sinus Rhythm | 120   |
| v630s   | Good    | Good    | Good    | Normal Sinus Rhythm | 150   |
| v630s   | Good    | Good    | Good    | Normal Sinus Rhythm | 165   |
| v630s   | Good    | Good    | Good    | Normal Sinus Rhythm | 30    |
| v630s   | Good    | Good    | Good    | Normal Sinus Rhythm | 180   |
| v630s   | Good    | Good    | Good    | Normal Sinus Rhythm | 195   |
| Time  | v630s | Status | Interpretation   | Rate |
|-------|-------|--------|------------------|------|
| 210   | Good  | Good   | Normal Sinus Rhythm | 210  |
| 225   | Good  | Good   | Normal Sinus Rhythm | 225  |
| 240   | Good  | Good   | Normal Sinus Rhythm | 240  |
| 255   | Good  | Good   | Normal Sinus Rhythm | 255  |
| 270   | Good  | Good   | Normal Sinus Rhythm | 270  |
| 285   | Good  | Good   | Normal Sinus Rhythm | 285  |
| 45    | Good  | Good   | Normal Sinus Rhythm | 45   |
| 60    | Good  | Good   | Normal Sinus Rhythm | 60   |
| 75    | Good  | Good   | Normal Sinus Rhythm | 75   |
| 90    | Good  | Good   | Normal Sinus Rhythm | 90   |
| 105   | Good  | Good   | Normal Sinus Rhythm | 105  |
| 15    | Good  | Good   | Normal Sinus Rhythm | 15   |
| 299   | Good  | Good   | VT               | 299  |
|       | 296.6 |        |                  |      |
|       | 299   |        |                  |      |
| 300   | Bad   | Good   | Noise/artifacts  | 300  |
|       |       |        |                  |      |
| 300   | Bad   | Bad    | Noise/artifacts  | 300  |
|       |       |        |                  |      |
| 300   | Good  | Good   | VT               | 300  |
|       | 296.5 |        |                  | 299.9|
|       |       |        |                  |      |
| 135   | Good  | Good   | Normal Sinus Rhythm | 135  |
| 120   | Good  | Good   | Normal Sinus Rhythm | 120  |
| 150   | Good  | Good   | Normal Sinus Rhythm | 150  |
| 165   | Good  | Good   | Normal Sinus Rhythm | 165  |
| 30    | Good  | Good   | Normal Sinus Rhythm | 30   |
| 180   | Good  | Good   | Normal Sinus Rhythm | 180  |
| 195   | Good  | Good   | Normal Sinus Rhythm | 195  |
| 210   | Good  | Good   | Normal Sinus Rhythm | 210  |
| 225   | Good  | Good   | Normal Sinus Rhythm | 225  |
| 240   | Good  | Good   | Normal Sinus Rhythm | 240  |
| 255   | Good  | Good   | Normal Sinus Rhythm | 255  |
| 270   | Good  | Good   | Normal Sinus Rhythm | 270  |
| Test | Quality | Interpretation | Condition | Value |
|------|---------|----------------|-----------|-------|
| v635l | Good | Good | Normal Sinus Rhythm | 285 |
| v635l | Good | Good | Normal Sinus Rhythm | 45 |
| v635l | Good | Good | Normal Sinus Rhythm | 60 |
| v635l | Good | Good | Normal Sinus Rhythm | 75 |
| v635l | Good | Good | Normal Sinus Rhythm | 90 |
| v635l | Good | Good | Normal Sinus Rhythm | 105 |
| v635l | Good | Good | Normal Sinus Rhythm | 15 |
| v636s | Good | Good | Paced | 300 |
| v638s | Good | Good | PVCs | 300 |
| v638s | Good | Good | PVCs | 135 |
| v638s | Good | Good | PVCs | 120 |
| v638s | Good | Good | PVCs | 150 |
| v638s | Good | Good | Normal Sinus Rhythm | 30 |
| v638s | Good | Good | PVCs | 180 |
| v638s | Good | Good | PVCs | 195 |
| v638s | Good | Good | PVCs | 210 |
| v638s | Good | Good | PVCs | 225 |
| v638s | Good | Good | PVCs | 240 |
| v638s | Good | Good | PVCs | 255 |
| v638s | Good | Good | PVCs | 270 |
| v638s | Good | Good | PVCs | 45 |
| v638s | Good | Good | Normal Sinus Rhythm | 60 |
| v638s | Good | Good | Normal Sinus Rhythm | 75 |
| v638s | Good | Good | Normal Sinus Rhythm | 90 |
| v638s | Good | Good | Normal Sinus Rhythm | 105 |
| v640s | Bad | Bad | Good | Noise/artifacts | 300 |
| v641l | Good | Good | Normal Sinus Rhythm | 300 |
| v641l | Good | Good | Normal Sinus Rhythm | 135 |
| v641l | v643l | v644s | v644s | v646s | v647l |
|-------|-------|-------|-------|-------|-------|
| Good  | Good  | Good  | Good  | Good  | Good  |
| Good  | Good  | Good  | Good  | Good  | Good  |
| Good  | Good  | Good  | Good  | Good  | Good  |
| Normal Sinus Rhythm  | Normal Sinus Rhythm  | Normal Sinus Rhythm  | Normal Sinus Rhythm  | Normal Sinus Rhythm  | Normal Sinus Rhythm  |
| 120   | 30    | 45    | 60    | 75    | 15    |
| Good  | Bad   | Good  | Good  | Good  | Good  |
| Good  | Good  | Good  | Good  | Good  | Good  |
| Noise/artifacts  | Noise/artifacts  | Normal Sinus Rhythm  | Normal Sinus Rhythm  | Normal Sinus Rhythm  | Normal Sinus Rhythm  |
| 300   | 300   | 135   | 30    | 45    | 60    |
| Good  | Good  | Good  | Good  | Good  | Good  |
| Good  | Good  | Good  | Good  | Good  | Good  |
| Normal Sinus Rhythm  | Normal Sinus Rhythm  | Normal Sinus Rhythm  | Normal Sinus Rhythm  | Normal Sinus Rhythm  | Normal Sinus Rhythm  |
| 30    | 45    | 60    | 75    | 90    | 300   |
| Good  | Good  | Good  | Good  | Good  | Good  |
| Good  | Good  | Good  | Good  | Good  | Good  |
| Paced | Paced | Paced | Paced | Paced | Paced |
| 135   | 30    | 45    | 60    | 75    | 90    |
| Good  | Good  | Good  | Good  | Good  | Good  |
| Good  | Good  | Good  | Good  | Good  | Good  |
| Normal Sinus Rhythm  | Normal Sinus Rhythm  | Normal Sinus Rhythm  | Normal Sinus Rhythm  | Normal Sinus Rhythm  | Normal Sinus Rhythm  |
| 300   | 135   | 30    | 45    | 45    | 60    |
| v647l | Good | Good | Good | Normal Sinus Rhythm | 75 |
|-------|------|------|------|---------------------|----|
| v647l | Good | Good | Good | Normal Sinus Rhythm | 15 |
| v648s | Good | Good | Good | VT                  | 300 |
| v648s | Good | Good | Good | Normal Sinus Rhythm | 135 |
| v649l | Bad  | Bad  | Bad  | Good                | Noise/artifacts | 300 |
| v652s | Good | Good | Good | VT                  | 300 |
| v652s | Good | Good | Good | VT                  | 300 |
| v652s | Good | Good | Good | Normal Sinus Rhythm | 135 |
| v658s | Good | Good | Good | Normal Sinus Rhythm | 15 |
| v660s | Good | Good | Good | Paced               | 300 |
| v663l | Bad  | Bad  | Good | Bad                 | Noise/artifacts | 300 |
| v666s | Bad  | Bad  | Good | Noise/artifacts     | 300 |
| v671l | Good | Good | Good | Normal Sinus Rhythm | 300 |
| v674s | Bad  | Bad  | Good | Noise/artifacts     | 300 |
| v676s | Bad  | Good | Good | Normal Sinus Rhythm | 300 |
| v676s | Good | Good | Good | Normal Sinus Rhythm | 135 |
| v682s | Good | Bad  | Bad  | Bad                 | PVCs | 300 |
| v686s | Bad  | Bad  | Bad  | Noise/artifacts     | 300 |
| v687l | Bad  | Bad  | Good | Noise/artifacts     | 300 |
| v692s | Bad  | Bad  | Bad  | Noise/artifacts     | 300 |
| v696s | Good | Good | Good | VT                  | 300 |
| v701l | Good | Good | Good | VT                  | 297.5 |
| v701l | Good | Good | Good | Normal Sinus Rhythm | 135 |
| v701l | Good | Good | Good | Normal Sinus Rhythm | 15  |
| v704s | Bad  | Bad  | Good | Noise/artifacts     | 300 |
| v710s | Bad  | Bad  | Bad  | Noise/artifacts     | 300 |
| 711l | Bad | Bad | Good | Noise/artifacts | 300 |
|------|-----|-----|------|-----------------|-----|
| 711l | Good | Good | Good | Normal Sinus Rhythm | 135 |
| 711l | Good | Good | Good | Normal Sinus Rhythm | 15 |
| 713l | Good | Good | Good | VT | 300 | 285 | 300 |
| 714s | Good | Good | Bad | VT | 300 | 297 | 300 |
| 718s | Bad | Bad | Good | Noise/artifacts | 300 |
| 720s | Good | Good | Good | Bad | Normal Sinus Rhythm | 300 |
| 721l | Bad | Bad | Bad | Good | Noise/artifacts | 300 |
| 724s | Good | Good | Good | NSVT | 300 |
| 724s | Good | Good | Good | PVC | 135 |
| 725l | Bad | Bad | Bad | Noise/artifacts | 300 |
| 726s | Good | Good | Good | Good | VT | 299 | 290.6 | 294.1 |
| 727l | Bad | Bad | Good | Bad | Noise/artifacts | 300 |
| 728s | Good | Good | Good | VT | 298.5 | 296.1 | 298.5 |
| 729l | Good | Good | Good | VT | 300 | 295.5 | 297.7 |
| 732s | Good | Good | Good | Normal Sinus Rhythm | 300 |
| 732s | Good | Good | Good | Normal Sinus Rhythm | 15 |
| 733l | Good | Good | Good | VT | 300 | 296.4 | 300 |
| 736s | Bad | Good | Bad | Noise/artifacts | 300 |
| 738s | Good | Good | Good | PVC | 300 |
| 743l | Bad | Bad | Good | Good | Noise/artifacts | 300 |
| 748s | Good | Good | Good | VT | 300 | 296.5 | 300 |
| 749l | Bad | Bad | Good | Noise/artifacts | 300 |
| 756s | Good | Good | Good | Normal Sinus Rhythm | 300 |
| 758s | Good | Good | Good | Good | VT | 298 | 296.4 | 298 |
| 759l | Good | Good | Good | NSVT | 300 |
| 761l | Good | Good | Good | VT | 300 | 296 | 298.7 |
| 763l | Bad | Bad | Bad | Noise/artifacts | 300 |
| v765l | Good | Good | Good | VT | 300 | 297.4 | 300 |
|-------|------|------|------|----|-----|--------|-----|
| v765l | Good | Good | Good | Normal Sinus Rhythm | 135 |
| v765l | Good | Good | Good | Normal Sinus Rhythm | 15 |
| v766s | Bad  | Bad  | Good | Noise/artifacts | 300 |
| v767l | Bad  | Good | Bad  | Bad | PVC | 300 |
| v769l | Good | Good | Good | VT | 300 | 295.7 | 300 |
| v769l | Good | Good | Good | Normal Sinus Rhythm | 135 |
| v769l | Good | Good | Good | Normal Sinus Rhythm | 15 |
| v770s | Bad  | Bad  | Bad  | Noise/artifacts | 300 |
| v772s | Good | Good | Good | VT | 300 | 297 | 300 |
| v772s | Good | Good | Good | Normal Sinus Rhythm | 135 |
| v773l | Good | Good | Good | VT | 299 | 296.6 | 299 |
| v774s | Bad  | Bad  | Bad  | Noise/artifacts | 300 |
| v775l | Bad  | Bad  | Bad  | Noise/artifacts | 300 |
| v779l | Good | Good | Good | PVC | 300 |
| v779l | Good | Good | Good | Normal Sinus Rhythm | 135 |
| v781l | Good | Good | Good | Bundle branch block | 300 |
| v782s | Bad  | Bad  | Bad  | Noise/artifacts | 300 |
| v783l | Good | Good | Good | NSVT | 300 |
| v784s | Good | Bad  | Good | Normal Sinus Rhythm | 300 |
| v788s | Good | Good | Good | VT | 292 | 289.8 | 292 |
| v791l | Bad  | Bad  | Bad  | Noise/artifacts | 300 |
| v793l | Good | Good | Good | VT | 299 | 296.5 | 299 |
| v793l | Good | Good | Good | Normal Sinus Rhythm | 135 |
| v793l | Good | Good | Good | Normal Sinus Rhythm | 15 |
| v795l | Bad  | Bad  | Good | Noise/artifacts | 300 |
| v795l | Good | Good | Good | Normal Sinus Rhythm | 135 |
| v795l | Bad  | Bad  | Good | Noise/artifacts | 15 |
| v797l | Good | Good | Good | VT | 300 | 297.1 | 300 |
|-------|------|------|------|----|-----|-------|-----|
| v803l | Good | Good | Good | VT | 294 | 290.7 | 294 |
| v804s | Bad  | Bad  | Bad  | Noise/artifacts | 300 |
| v805l | Bad  | Bad  | Good | Noise/artifacts | 300 | 294.8 | 300 |
| v805l | Good | Good | Good | Normal Sinus Rhythm | 135 |
| v805l | Good | Good | Good | Normal Sinus Rhythm | 15  |
| v806s | Good | Good | Good | VT | 297.5 | 295.4 | 297.5 |
| v808s | Good | Good | Good | Paced | 300 |
| v809l | Good | Good | Good | Normal Sinus Rhythm | 300 |
| v811l | Bad  | Bad  | Good | Noise/artifacts | 300 |
| v811l | Good | Good | Good | Normal Sinus Rhythm | 135 |
| v811l | Good | Good | Good | Normal Sinus Rhythm | 15  |
| v813l | Good | Good | Good | VT | 299 | 296.5 | 299 |
| v813l | Good | Good | Good | Normal Sinus Rhythm | 135 |
| v814s | Bad  | Bad  | Bad  | Noise/artifacts | 300 |
| v815l | Good | Good | Good | VT | 300 | 285.6 | 300 |
| v818s | Good | Good | Good | VT | 300 | 297.1 | 300 |
| v823l | Good | Good | Good | VT | 297 | 294 | 297 |
| v823l | Good | Good | Good | Normal Sinus Rhythm | 135 |
| v826s | Bad  | Good | Good | Noise/artifacts | 300 |
| v827l | Bad  | Bad  | Bad  | Noise/artifacts | 300 |
| v828s | Good | Good | Good | VT | 294 | 291.4 | 294 |
| v830s | Good | Good | Good | Paced | 300 |
| v831l | Good | Good | Good | VT | 294 | 289.7 | 293.9 |
| v831l | Good | Good | Good | Normal Sinus Rhythm | 135 |
| v831l | Good | Good | Good | Normal Sinus Rhythm | 15  |
| v833l | Good | Good | Good | Normal Sinus Rhythm | 300 |
| v834s | Good | Good | Bad  | NSVT | 300 |
| Patient | Electrode Quality | Signal Quality | Noise Quality | Rhythm | Rate |
|---------|------------------|----------------|--------------|--------|------|
| v836s   | Good             | Good           | Good         | Paced  | 300  |
| v837l   | Good             | Good           | Good         | VT     | 300  | 296.4 | 300  |
| v837l   | Good             | Good           | Good         | PVC    | 135  |
| v842s   | Good             | Good           | Good         | Paced  | 298.25 |
| v843l   | Bad              | Bad            | Good         | Noise/artifacts | 300 |
| v843l   | Good             | Good           | Good         | Normal Sinus Rhythm | 15  |
| v844s   | Good             | Good           | Good         | Paced  | 300  |
| v845l   | Good             | Good           | Good         | Normal Sinus Rhythm | 300 |
| v846s   | Bad              | Bad            | Bad          | Noise/artifacts | 300 |
| v848s   | Good             | Good           | Good         | Normal Sinus Rhythm | 300 |

VF: ventricular fibrillation; VT: ventricular tachycardia; PVCs: premature ventricular contractions; PACs: premature atrial contractions, NSVT: non-sustained ventricular tachycardia.
Figure S1. ROC of ECG noise detector for classifiers based on (i) only features, (ii) only CNN approach and (iii) hybrid-CNN approach, with an AUC of 93.56%, 96.97% and 97.17% respectively.
Figure S2. Gradient-weighted class activation mapping (Grad-CAM) of trained convolutional neural network (CNN) corresponding to Tier-3 (normal vs atrial fibrillation) classifier.

First channel of ECG signal is represented with the gray level proportional to CAM amplitude, which represents the regions of interest on the given signal that leads its classification into an AF class by CNN. The most important region within the signal correspond to a missing P-waves and an R-peak with irregular rhythm preceding and following RR intervals, which agrees with the characteristics of AF.
Figure S3. Feature importance scores of only feature based (A) Tier-1 classifier, the most important features for classification are median frequency and ratio of maximum power to total power, which are characteristics of VT and VF. (B) Tier-2 classifier, with high importance score for ECG heart rate, which distinguishes extreme bradycardia, extreme tachycardia and other conditions. (C) Tier-3 classifier, in which high importance is assigned to the standard deviation of heart rate and mean p-wave area, which are characteristics of atrial fibrillation.
Median frequency

Maximum heart rate over five beats

Mean frequency

Maximum power to total power ratio

Dominant frequency

Complexity measure

Co-dominant frequencies above 0.2 Hz

Correlation measure

Maximum of mean difference between low frequency sub-peaks

Heart rate

Ratio of max power below 12 Hz to maximum power above 15 Hz

Five consecutive ventricular tachycardia beats

Ratio of maximum power over 12 Hz to total power

Sharpness measure

Co-dominant frequencies above 0.5 Hz

Low frequency power dominant

Ratio of max power below 12 Hz to average of 15 Hz to 20 Hz

Heart rate criterion of ventricular tachycardia

Bandwidth

Maximum amplitude

No peaks

Decreasing Delta-P

Normalized importance score
features

P and PP features

Normalized importance score

Heart rate

Number of heartbeats

Number of beats slower than 40 bpm

Not enough beats to detect extreme tachycardia

Heart rate criterion of extreme tachycardia

Periodicity measure

Minimum heart rate

Heart rate criterion of extreme bradycardia

Correlation measure

Peak height stability measure

ECG Maximum heart rate

ECG Sharpness measure

Maximum period

Minimum heart rate

Beats slower than 40 bpm

Periodicity measure

Amplitude decrease

Correlation measure

Delta-P Stability measure

Max amplitude after onset

Max amplitude before onset

Enough beats to detect ET

Maximum heart rate

Min pressure at largest gap

Normalized importance score

0 0.05 0.1 0.15 0.2

ECG Channel-4
ECG Channel-3
ECG Channel-2
ECG Channel-1
PPG
BP
