

Programming Overview

Step 1

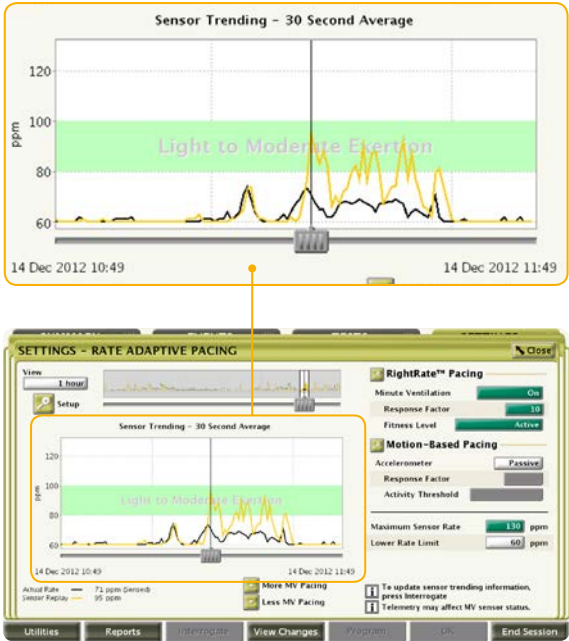
Assess Chronotropic Competence

Step 2

Prepare Calibration and Sensor Baseline

Step 3

Optimize Sensor Trending Data



Rate Adaptive Pacing

A motion-based accelerometer may not always detect when the patient is exercising, potentially resulting in inadequate rate response.

- Riding a bicycle
- Holding a grandchild
- Carrying groceries
- Working in the garden
- Using a walker
- Swimming
- Lifting weights

RightRate™

- RightRate is a physiologic minute ventilation sensor that is highly correlated with breathing.
- The only sensor clinically proven to restore chronotropic competence.¹
- VISIONIST X4 is labeled for up to **13.1 years**² projected longevity even when RightRate is turned ON.



1. Chronotropic competence is defined by the Model of the Cardiac Chronotropic Response to Exercise. Wilkoff B, Corey J, Blackburn G. A mathematical model of the cardiac chronotropic response to exercise. Journal of Electrophysiology. 1989;3:176-180.
2. Assumes: 2.0V RA/RV/LV, RA 500Q, RV/LV 700Q, No LATITUDE, 0.4ms pulse width, 100% BIV pacing, 15% atrial pacing, 70 ppm LRL.

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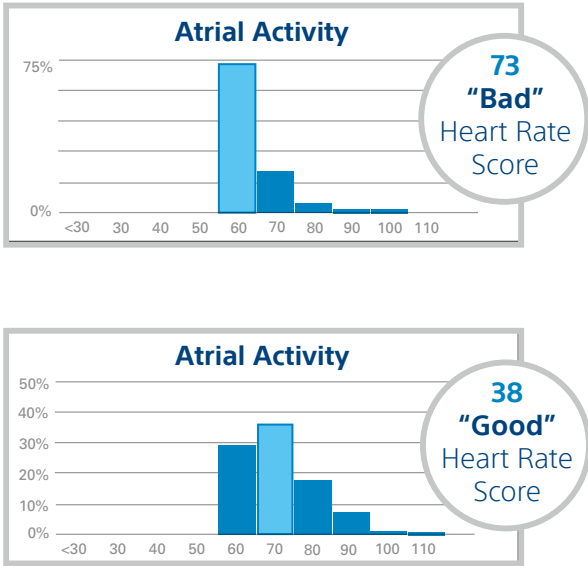
RightRate™
Respiration Based-Pacing



A Change of Pace

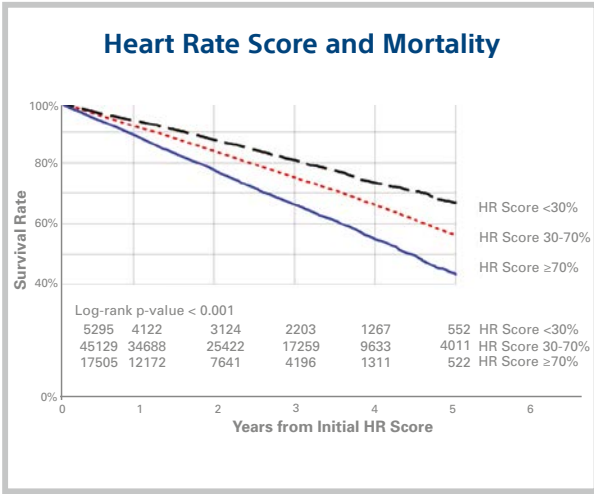
RightRate™ and Heart Rate Score Clinical Data

Heart Rate Score is defined as the height of the tallest atrial histogram bin.



A broader range of HR is typically better for the patient. Therefore, a lower HR Score is preferred.

Heart Rate Score was an independent predictor of **mortality**.³



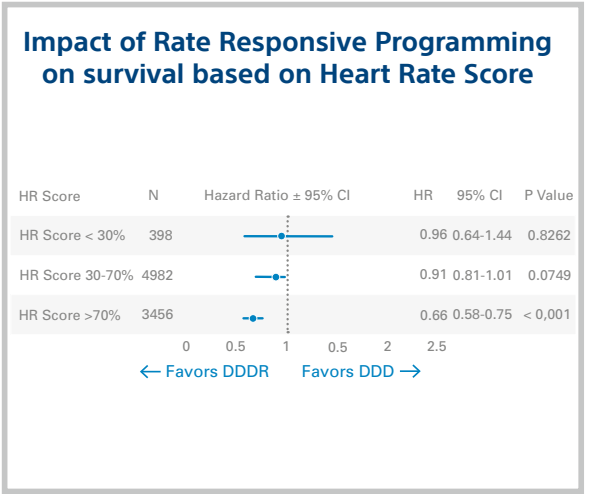
LATITUDE™ analysis of 67,929 CRT-D patients

Patients with a HR Score ≥ 70 had a 43% 5-year survival rate.

Patients with a HR Score < 30 had a 68% 5-year survival rate.

3. Wilkoff et al., A Device Histogram based Simple Predictor of Mortality Risk in ICD and CRT-D Patients: The Heart Rate Score. *Pace* 2017.

Mortality improved with DDDR.⁴



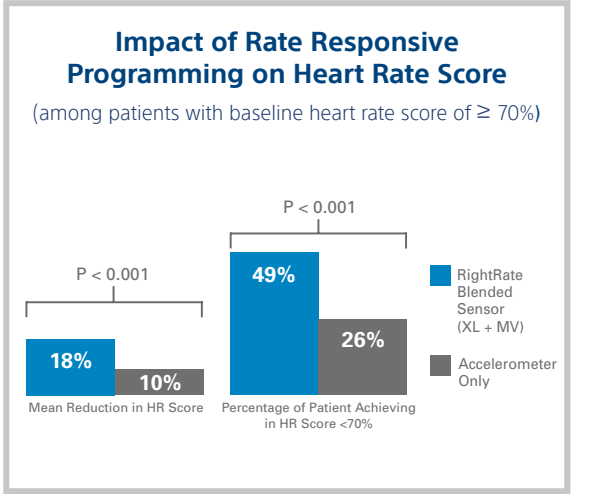
LATITUDE™ analysis of 6,164 patients

For patients with Heart Rate Score > 70 , switching to DDDR was associated with improved mortality.

Patients with baseline Heart Rate Score $> 70\%$ significantly improved their Heart Rate Score, with DDDR (from $88 \pm 9\%$ to $78 \pm 15\%$; $P < 0.001$).

4. Olshansky, et al., Survival After Rate-Responsive Programming in Patients With Cardiac Resynchronization Therapy-Defibrillator Implants Is Associated With a Novel Parameter: The Heart Rate Score. *Circ Arrhythm Electrophysiol.* 2016;9:.

RightRate™ Blended Sensor was shown to **improve Heart Rate Score** more than accelerometer alone.⁵



Analysis of 501 patients from the LIFE Study

RightRate Blended sensor (MV+XL) resulted in:

- Heart Rate Score reduction of 18%.
- Converted almost twice as many patients to Heart Rate Score $< 70\%$ when compared to XL only.

5. Richards, et al., The Addition of Minute Ventilation to Rate Responsive Pacing Improves Heart Rate Score More than Accelerometer Alone. *Heart Rhythm* 2018. <https://doi.org/10.1016/j.hrthm.2018.06.021>.