MicroPort®

SonR® TECHNOLOGY

HEMODYNAMIC INTELLIGENCE

for effective and effortless results

BEYOND THE STANDARD CRT WITH SonR®

The hemodynamic optimization for an improved outcome[1]

UNIQUE AND HEMODYNAMIC

SonR® is a unique technology that uses a hemodynamic sensor to determine the optimal AV and VV delays.

SENSOR-BASED

The SonR® sensor is embedded in the tip of the SonR® Tip atrial lead. It detects a contractility-based signal correlated with the first heart sound and the LV dP/dT max.

AUTOMATIC AND COMPLETE

SonR® automatically optimizes the AV and VV delays under various conditions: at rest, during exercise, while pacing the atrium, and in sinus-driven rhythm.

EFFECTIVE AND BENEFICIAL

Patients optimized with SonR® show enhanced responsiveness to CRT therapy and experience fewer hospitalizations for heart failure.[1]

TIME-SAVING AND RELIABLE

SonR® periodically optimizes AV/VV delays in alignment with the echographic method, requiring no effort at follow-up.

PROVEN TO PROVIDE AN EXCELLENT RESPONSE TO CRT THERAPY...

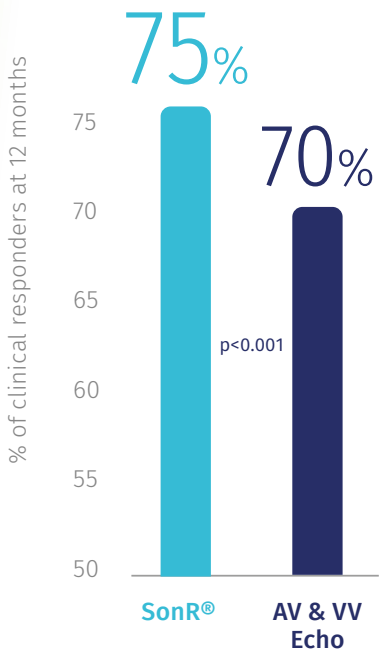
The RESPOND-CRT study highlighted how SonR® brings a real benefit to patients, inducing a greater response to CRT therapy and a reduction in Heart Failure (HF) hospitalizations both in the overall treated population and in specific subgroups.

SonR® improves the rate of CRT responders in the overall population.

The prospective, randomized, double-blind RESPOND CRT[1] trial demonstrated that SonR® technology is:
- safe and effective
- non-inferior to echo-optimization
- able to reduce hospitalizations for Heart Failure

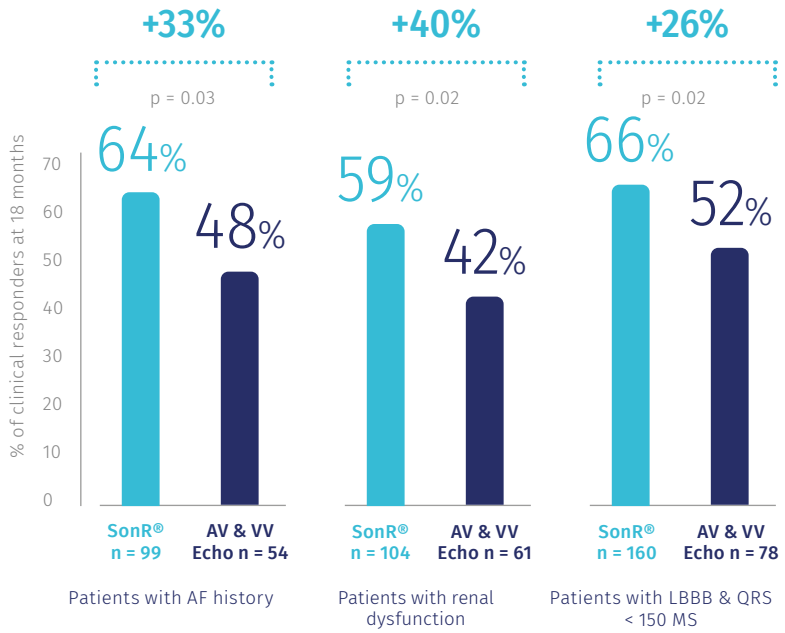
RESPOND CRT primary endpoint[1]

(N=1400 patients)



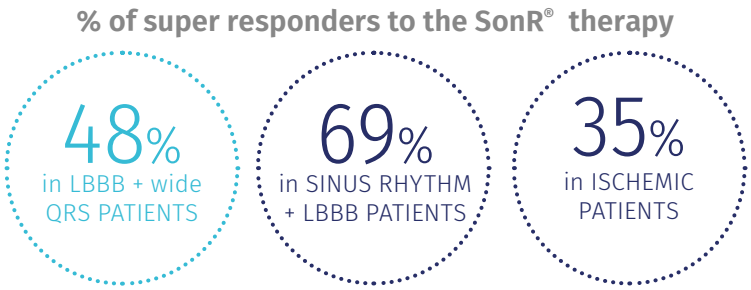
In patients with specific underlying conditions.

SonR® has also proven to be particularly effective in specific subgroups of patients with pre-existing conditions that are less likely to respond to CRT therapy[1], like patients with:
– history of AF (+33% of responders),[1]
– renal dysfunction (40% of responders),[1]
– or LBBB with narrow QRS (26% of responders).[2]



Turning responders into Super-responders.

The analysis of RESPOND CRT subgroups and results collected in smaller cohorts show that SonR® enhances the clinical response to CRT, and increases the number of super responders.
– 48% of super responders after 2 years (ΔLVEF ≥ 30%), in patients with LBBB & QRS > 150ms (RESPOND CRT)[2]
– 69 % of super responders (LVEF >40% and ΔLVEF>20%) after 6 months (Oliveira et al)[3]
– 35% of super responders (ΔLVEF >15% and ΔNYHA class ≥–1) in ischemic patients after 6 months (Covino et al)[4]

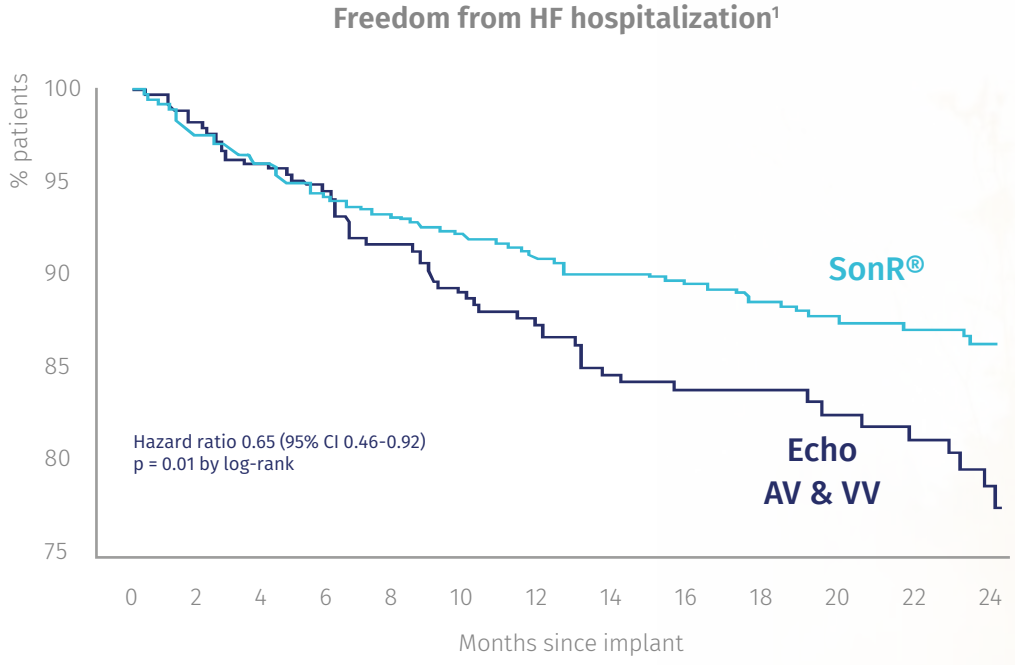


… AND SIGNIFICANTLY REDUCE HF HOSPITALIZATIONS

HF Hospitalizations cost billions per year, being a burden for the Health Care system and negatively affecting the patient's QoL (Quality of Life). SonR® can cut HF hospitalizations by up to 52%, with a positive impact on the patient's lives and hospital resources.[1]

Prioritize patient care while optimizing resources with SonR®

Tear up the time spent on echo-guided optimization. SonR® automates the process, optimizing your patients' care, weekly. Plus, by reducing HF hospitalizations, SonR® frees up valuable time, resources, and funds.[1]



35%
less HF hospitalizations in the study patient cohort after 12 months[1]

52%
less HF hospitalizations in patients with a History of AF (15% of the population)[5]

45%
less HF hospitalizations in patients with Renal dysfunction (23% of the population)[5]

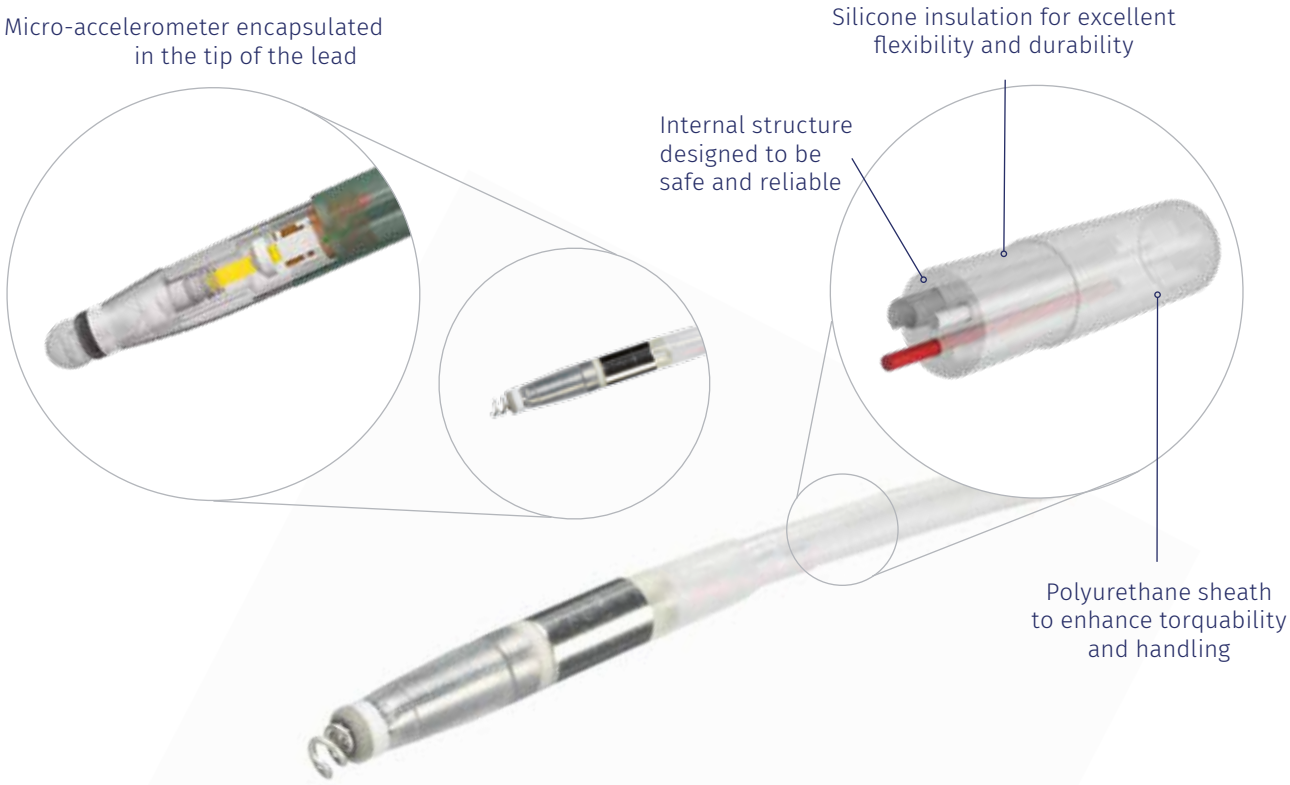
38%
less HF hospitalizations in patients with Narrow QRS & LBBB (24% of the population)[5]

Give your patient the chance to stay out of the hospital

The RESPOND CRT trial demonstrates the positive impact of SonR® optimization on HF hospitalizations. Patients optimized with SonR® experienced a significant decrease in HF hospitalizations compared to the controlled group optimized with the echocardiographic method.[1]

IT ALL STARTS IN THE ATRIAL LEAD

SonR® Tip is the only pacing-sensing atrial lead embedding a micro-accelerometer on its tip. With a sensor measuring just 12 millimeters - result of years of study and innovation - the heart's mechanical response can be detected and analyzed.



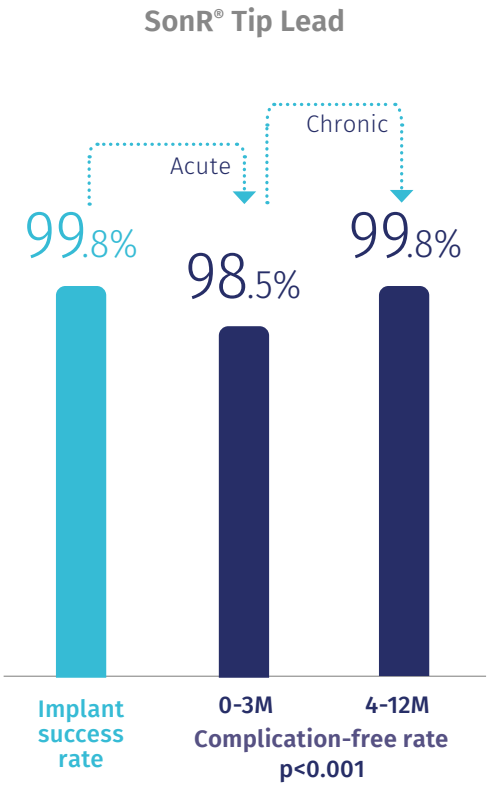
The only atrial lead able to listen to the heart, electrically and mechanically.

SonR® Tip offers the unique possibility of a hemodynamic insight into the patient's heart.

The micro-accelerometer detects beat-to-beat vibrations generated by the heart, and correlated to LV contractility[6,7,8].

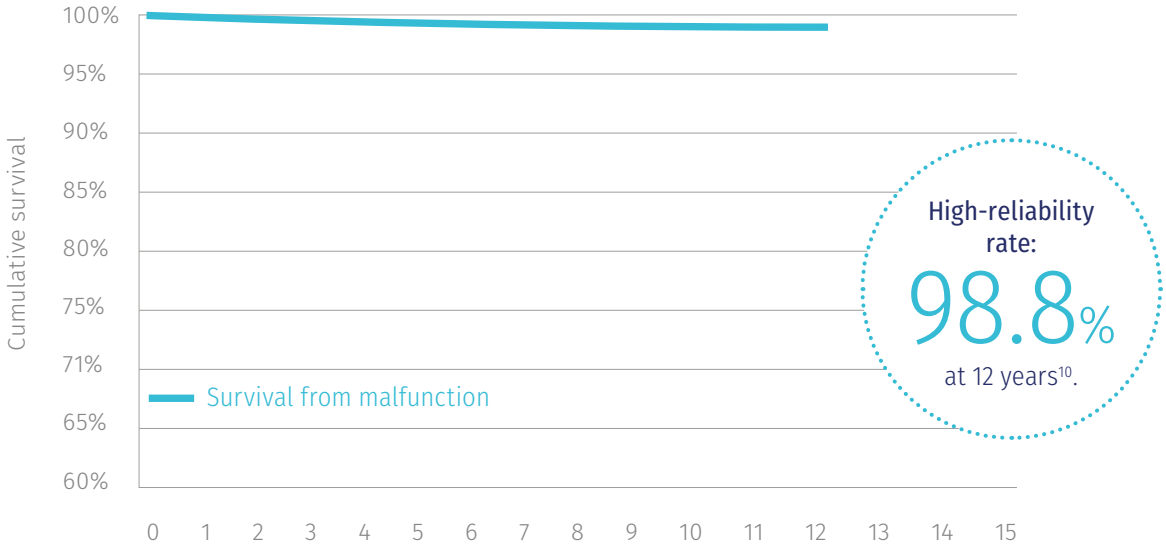
Easy to manage, from the implant to the follow-up.

- SonR® Tip recorded above 99% of implant success rate and freedom from complications[1]
- Good torque and reliable handling ensure an effortless positioning.[9]
- Electrical values are stable over time and in the expected standard range[9]



Proven to be safe and reliable for 15+ years.

Since its launch in 2011, SonR® Tip has shown a remarkable performance over time.[10]



	Cumulative sirvival from malfunction with 95% condidence interval, as a function of years after implant[10]											
Years after implant	1	2	3	4	5	6	7	8	9	10	11	12
Cumulative survival from malfunction in %	99.74	99.59	99.48	99.33	99.24	99.06	98.98	98.9	98.86	98.78	98.78	98.78
Upper confidence interval (+) in %	0.08	0.11	0.13	0.15	0.16	0.18	0.19	0.2	0.21	0.22	0.22	0.22
Lower confidence interval (-) in %	0.12	0.15	0.17	0.19	0.2	0.22	0.24	0.25	0.26	0.27	0.27	0.27

EVERY HEARTBEAT OF YOUR PATIENTS CAN BE LISTENED

The SonR® signal, detected by the SonR® Tip, is generated by the mechanical vibrations of the heart muscle—specifically those that produce the first heart sound (S1)[11]. This signal serves as an indirect indicator of left ventricular (LV) contractility, providing crucial insights for optimizing device configuration.[8,11]

SonR® signal peak reflects the isovolumetric contraction of the Left Ventricle[8]

At each cardiac cycle, mechanical vibrations peak during the isovolumetric contraction phase originating the first heart sound detected by SonR®, independently from local ischemia and wall kinetics.[12]

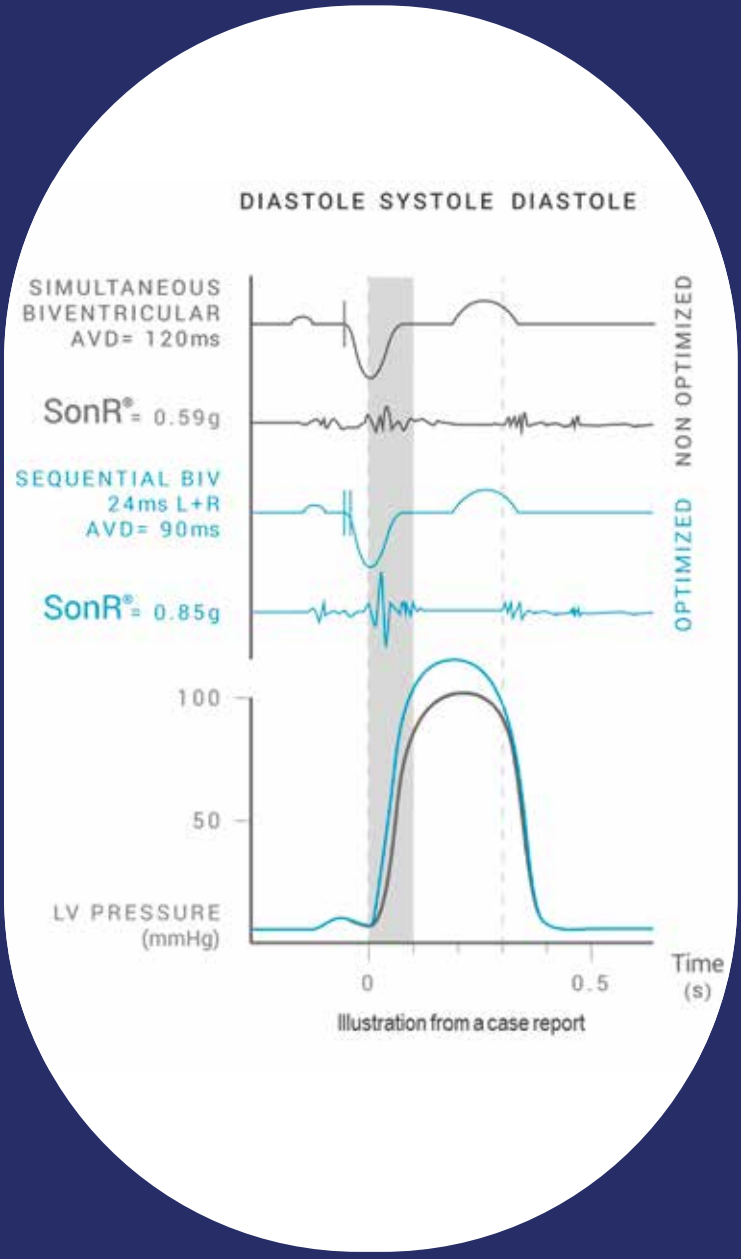
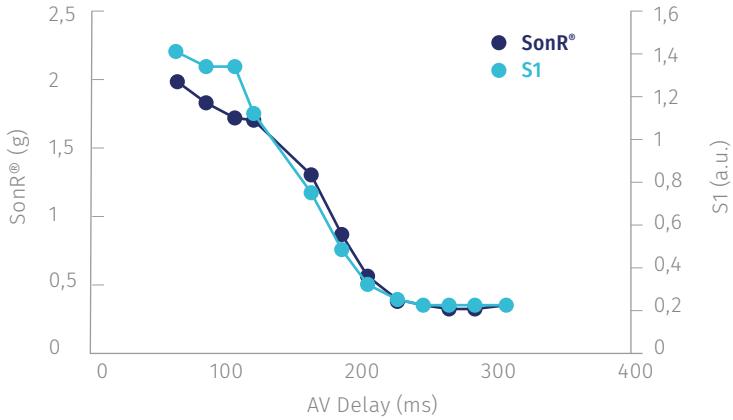


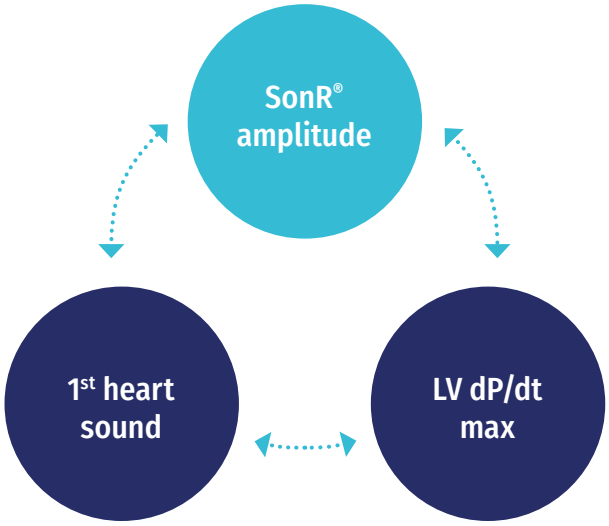
Illustration from a case report



SonR® amplitude is correlated with the first heart sound

The amplitude of the First Heart Sound (S1) is correlated with LVdP/dt max[11], and is considered an index of cardiac contractility[8].

The SonR® signal strongly correlates with the First Heart Sound under different pacing conditions, allowing the evaluation of the cardiac function[11,12].



And with the LV contractility (LV dP/dtmax)

The SonR® signal reflects cardiac contractility and is correlated to the LV dP/dt signal[8].

There is a strong correlation between the optimal delays found invasively measuring the LVdp/dTmax, and the ones identified by SonR®.[12- 14]

This validates the SonR® technology as a method for hemodynamic CRT optimization.

SONR® PROVIDES A COMPLETE HEMODYNAMIC CRT OPTIMIZATION...

SonR® technology is used in MicroPort® CRT-D devices to provide an automatic, periodic, and complete optimization of the AV and VV delays, based on the patient's hemodynamic response[3].

SonR® technology optimizes AV and VV delays together

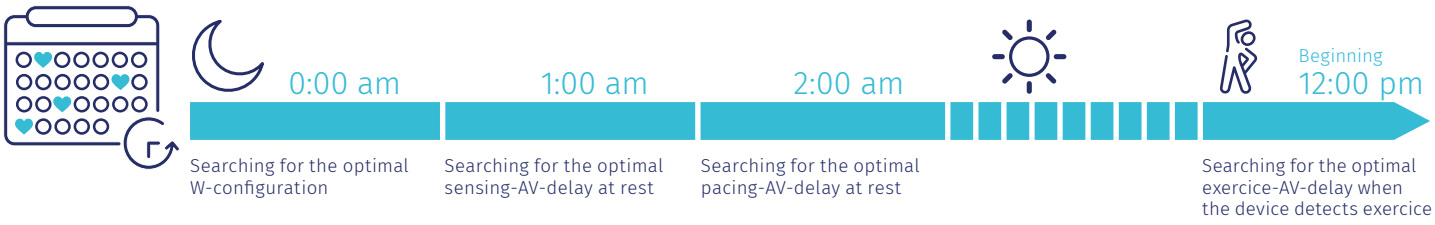
With SonR® technology, the AV and VV delays are optimized together to identify the best overall pair of values.[12]

More than just another negative hysteresis algorithm

SonR® goes beyond the traditional approach: it is based on heart contractility.

It automatically tests several AV/VV delay combinations in search of the best-performing one.

The resulting value is tailored and fine-tuned for each patient, ensuring the filling time while preserving the contraction's effectiveness over time.[16]



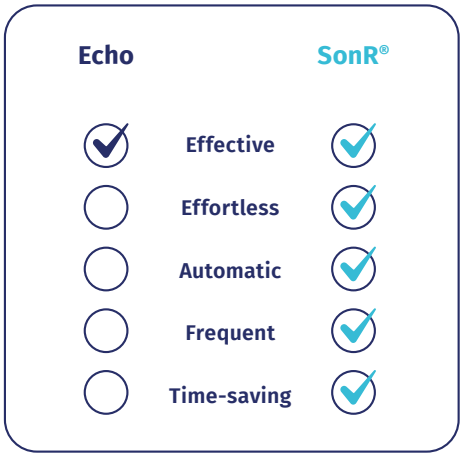
The optimal delays are carefully selected to prioritize robust SonR® values across dynamic conditions

Every week, up to 42 VV-delays configurations are tested along several AV-delays, looking for the best SonR® performance overall.

The optimization is performed in rest and exercise conditions to ensure the best hemodynamic performance.

… AND IS DESIGNED TO BE FULLY AUTOMATIC, VERSATILE, AND TIME-SAVING

SonR® Optimization is suitable for a large CRT population[1,15,17,18] and easy to program: just turn it ON and the algorithm finds the right moments and conditions to perform the optimization, all automatically.



Like an Echo and more: anytime, anywhere, without added complexity

Optimal settings found with SonR® are coherent with the echo-guided method, the gold standard practice[1].

The SonR® algorithm:
- identifies specific AV delays for rest and exercise on a weekly basis;
- continuously adjusts the CRT therapy to the patient's evolving needs;
- automatically transforms patient care by overcoming the imitations of traditional optimization.

Experience the convenience of an effortless optimization

SonR® puts personalized care at your fingertips.
- Activation is as easy as a single click.
- No initial measurements or ongoing adjustments are required.
- It ensures a seamless and hassle-free experience[14].
- Algorithm's performance and SonR® amplitude can be monitored from implant, during in-clinic or remote follow-ups.

The most consistent performance, regardless of heart rhythm

SonR® works effectively across several cardiac rhythms*: sinus rhythm, sinus node disease, and all types of AV block.[18]

	Rest AVD Opt	Exercise AV Opt.	VV optm.
Sinus Rhythm	✓ Performed with Ap + As	✓	✓
SND	✓ Performed with Ap	✓	✓
AVB (all types)	✓ Performed with Ap + As	✓	✓

*except permanent AF

MONITOR YOUR PATIENTS EASILY AND EFFECTIVELY WITH SONR®

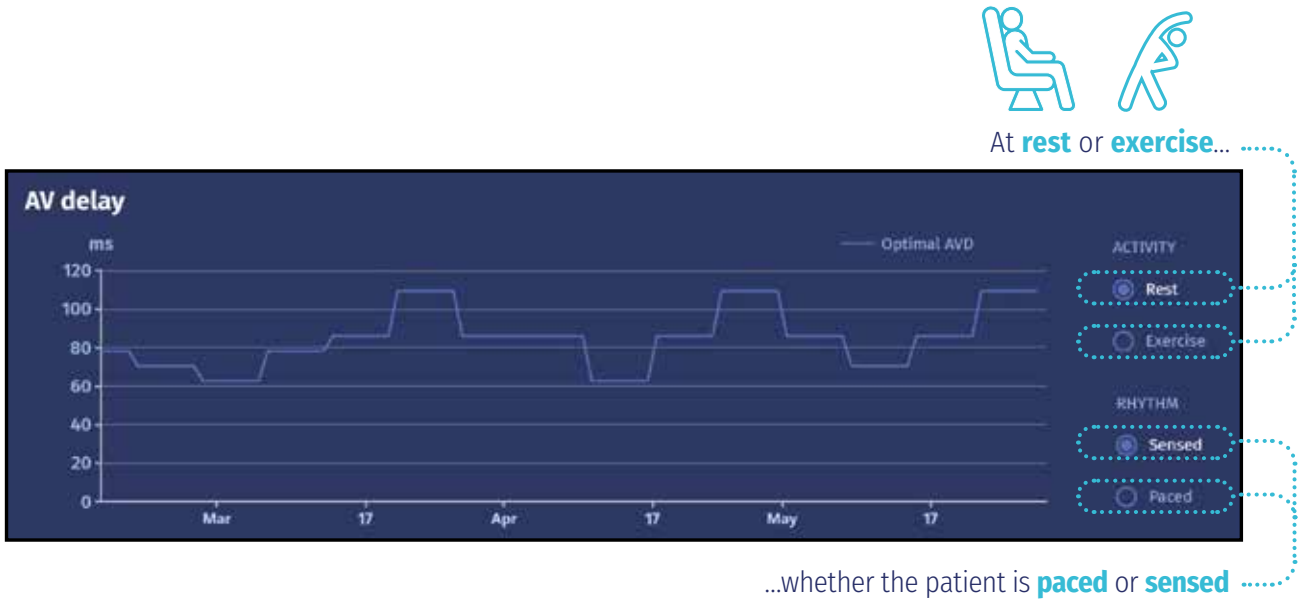
EASY AND QUICK TO PROGRAM

SonR® activation is just one click away

- Automatic set up
- It doesn't require any manual measure
- Personalized optimization (AV+VV or AV only) and exercise

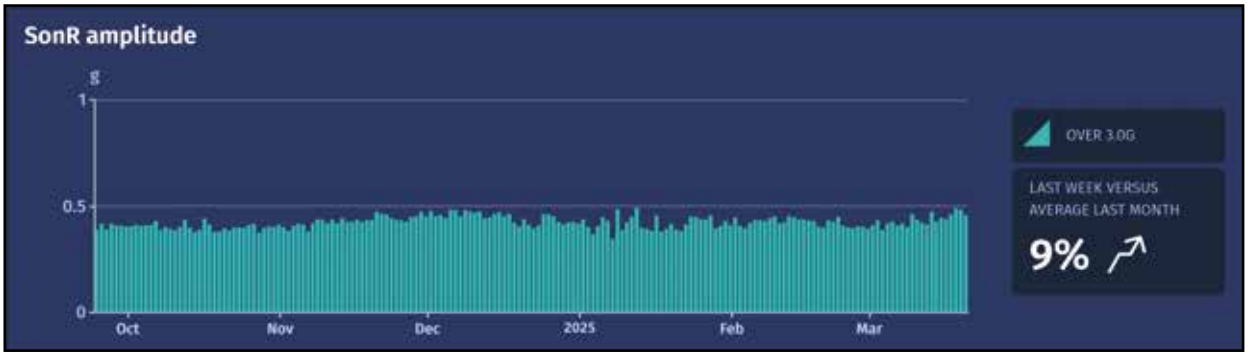
INFORMATIVE AND COMPLETE FOLLOW-UP

Check how SonR® reprograms the device to reach optimized values in all the configurations



DETECTABLE PERFORMANCE

Monitor the signal and the algorithm performance over time



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TALENTIA™

MicroPort® CRT-D SYSTEM

For more information, refer to

Manufactured in Europe by MicroPort® CRM

MICROPORT CRM S.R.L.
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ITALY

THE RESPOND CRT SYSTEM WITH SONR® TECHNOLOGY IS NOT AVAILABLE FOR SALE OR DISTRIBUTION IN THE USA.

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