

# Reducing the Risks of CRT-D Replacement

## Longevity Performance

### POWERED BY ENDURALIFE™ BATTERY TECHNOLOGY

Better CRT-D longevity could mean a reduced risk of exposure to complications and infections for your patients.<sup>5,6,7</sup> Boston Scientific CRT-Ds have the longest projected longevity on the market – with up to 80% more battery capacity than Medtronic devices.<sup>8</sup>

Multiple clinical studies confirm Boston Scientific CRT-Ds outperformed Medtronic CRT-Ds:<sup>9</sup>

## ENDURALIFE™<sup>14</sup> Battery Technology



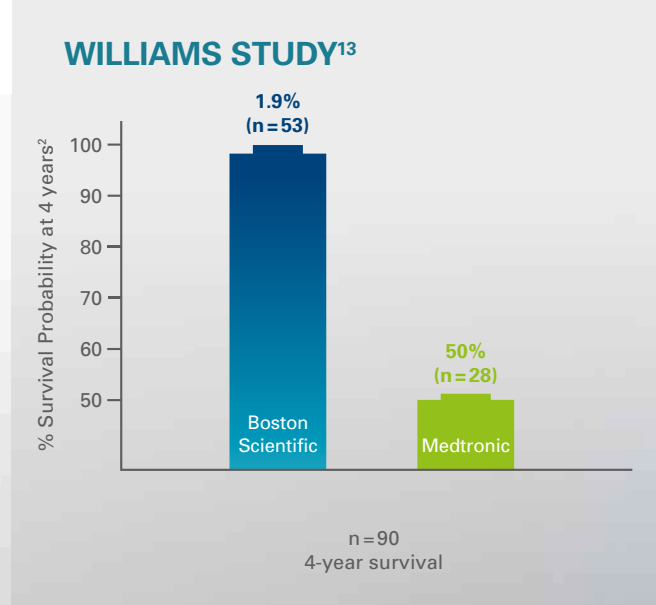
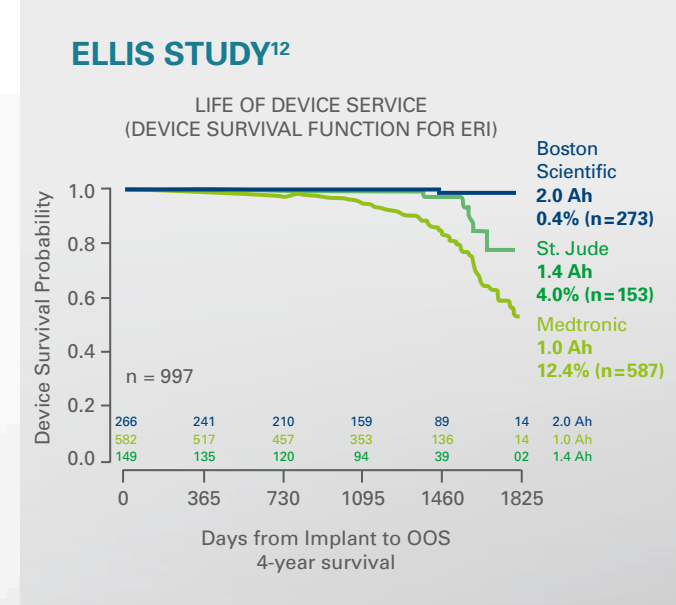
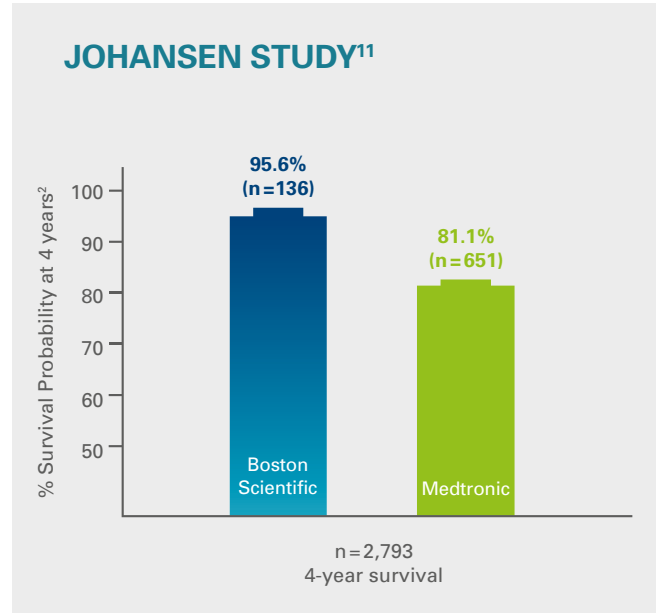
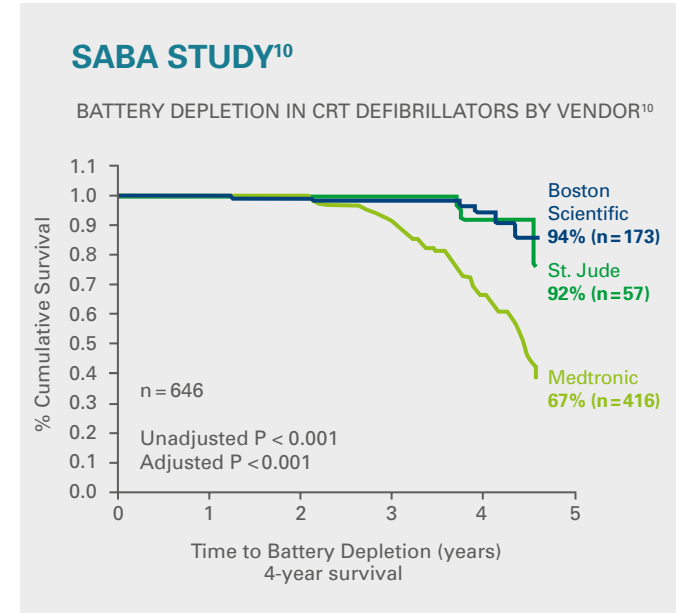
Capacity  
+ Chemistry  
+ Efficiency

# X4 CRT-D System



One Click for a  
Potential  
Lifetime Benefit

Now with  
VectorGuide™



#### Boston Scientific X4<sup>†</sup> models include

AUTOGEN™ X4 CRT-D, DYNAGEN™ X4 CRT-D, INOGEN™ X4 CRT-D

<sup>†</sup> Product availability may vary, please contact your local sales representative for additional information.

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- Singh JP et al. Left ventricular lead position and clinical outcome in the multicenter automatic defibrillator implantation trial-cardiac resynchronization therapy (MADIT-CRT) trial. *Circulation* 2011;123:1159–1166.
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- Boston Scientific ICDs and CRT-Ds with contemporary battery technology have 1.8 Ah. Medtronic ICDs and CRT-Ds have 1.0 Ah.
- Boston Scientific CRT-Ds with contemporary battery technology have 1.8 Ah. All Medtronic CRT-Ds have 1.0 Ah.
- Alan MB, Munir MB, Rattan R, Flanagan S, Adelstein E, Jain S, Saba S. Battery longevity in cardiac resynchronization therapy implantable cardioverter defibrillators. *Europace* (2014) 16, 246-251. First published online: October 6, 2013. Battery Longevity in Cardiac Resynchronization Therapy Implantable Cardioverter Defibrillators was an independent, single-center, retrospective observational study comparing battery longevity of contemporary cardiac resynchronization therapy defibrillators (CRT-Ds) of all patients implanted with CRT-ICDs from January 1, 2007, to October 31, 2013, in all clinical settings in Denmark. The initial study population included 2,793 patients: battery depletion or device failure was identified in 43 Medtronic, 4 Biotronik, 1 Boston Scientific and 33 St. Jude devices. The four-year survival rate was 81.1% for Medtronic, 95.8% for Biotronik, 95.7% for Boston Scientific and 93.6% for St. Jude Medical. Medtronic = 651 patients, Boston Scientific = 136 patients, St. Jude = 1,587 patients, Biotronik = 389 patients. Time to exchange of the device because of battery depletion or device failure recorded in the Danish ICD Registry was the endpoint.
- Haarbo J, Hjortshoj S, Johansen J, Jorgensen O, Nielsen J, Petersen H. Device Longevity in Cardiac Resynchronization Therapy Implantable Cardioverter Defibrillators Differs Between Manufacturers: Data from the Danish ICD Registry. Presented at HRS 2014. <http://onlinelibrary.wiley.com/doi/10.1111/and.12414>
- Haarbo J, Hjortshoj S, Johansen J, Jorgensen O, Nielsen J, Petersen H. Device Longevity in Cardiac Resynchronization Therapy Implantable Cardioverter Defibrillators Differs Between Manufacturers was an independent, retrospective observational study comparing battery longevity of contemporary cardiac resynchronization therapy defibrillators (CRT-Ds) of all patients implanted with CRT-ICDs from January 1, 2007, to October 31, 2013, in all clinical settings in Denmark. The initial study population included 2,793 patients: battery depletion or device failure was identified in 43 Medtronic, 4 Biotronik, 1 Boston Scientific and 33 St. Jude devices. The four-year survival rate was 81.1% for Medtronic, 95.8% for Biotronik, 95.7% for Boston Scientific and 93.6% for St. Jude Medical. Medtronic = 651 patients, Boston Scientific = 136 patients, St. Jude = 1,587 patients, Biotronik = 389 patients. Time to exchange of the device because of battery depletion or device failure recorded in the Danish ICD Registry was the endpoint.
- C. Ellis, T. Markus, D. Dickerman, J. Orton, S. Hassan, E. Good, T. Okabe, A. Greenspon. Ampere Hour as a Predictor of CRT ICD Pulse Generator Longevity: A Multi-Center Study. Presented at HFSA 2014. [http://www.onlinejci.com/article/S1071-9164\(14\)00337-6/fulltext](http://www.onlinejci.com/article/S1071-9164(14)00337-6/fulltext) Ampere Hour (Ah) as a Predictor of CRT ICD Pulse Generator Battery Longevity was a multi-center, retrospective, observational study comparing battery longevity of contemporary cardiac resynchronization therapy defibrillators (CRT-Ds) of all patients implanted with CRT-ICDs from August 1, 2008, to December 31, 2010, at Vanderbilt University, Eastside Cardiovascular Medicine, University of Michigan, Thomas Jefferson University, Robert Wood Johnson University Hospital, Cooper Health System and North Ohio Research. Survival rate calculated using device replacements for battery depletion as indicated by ERI.
- Williams J, Stevenson R. Contemporary Cardiac Resynchronization Implantable Cardioverter Defibrillator Battery Longevity in a Community Hospital Heart Failure Cohort. Abstract published in *Journal of Cardiac Failure*, Vol. 20 No 8S, pS56, August 2014. Presented at HFSA September 2014. [http://www.onlinejci.com/article/S1071-9164\(14\)00385-3/fulltext](http://www.onlinejci.com/article/S1071-9164(14)00385-3/fulltext) Contemporary Cardiac Resynchronization. Implantable Cardioverter Defibrillator Battery Longevity in a Community Hospital Heart Failure Cohort was an independent, retrospective observational study comparing battery longevity of contemporary cardiac resynchronization therapy defibrillators (CRT-Ds) of all patients implanted with CRT-ICDs from July 1, 2008, to October 31, 2010, at The Good Samaritan Hospital in Lebanon, PA. A total of 90 patients were included in the study population. The 4-year survival rate was 50% for Medtronic, 90% for St. Jude Medical and 95.1% for Boston Scientific. Medtronic = 28 patients, St. Jude = 10 patients, Boston Scientific = 53 patients. Survival rate calculated using device replacements for battery depletion as indicated by ERI.
- Enduralife™ Battery Technology is featured in X4 CRT-Ds and EL ICDs, as well as Cognia™, Teligen™, Punctus™, Energen™, Incepta™ ICDs and CRT-Ds.

All cited trademarks are the property of their respective owners. CAUTION: The law restricts these devices to sale by or on the order of a physician. Indications, contraindications, warnings and instructions for use can be found in the product labeling supplied with each device. Information for the use only in countries with applicable health authority product registrations.

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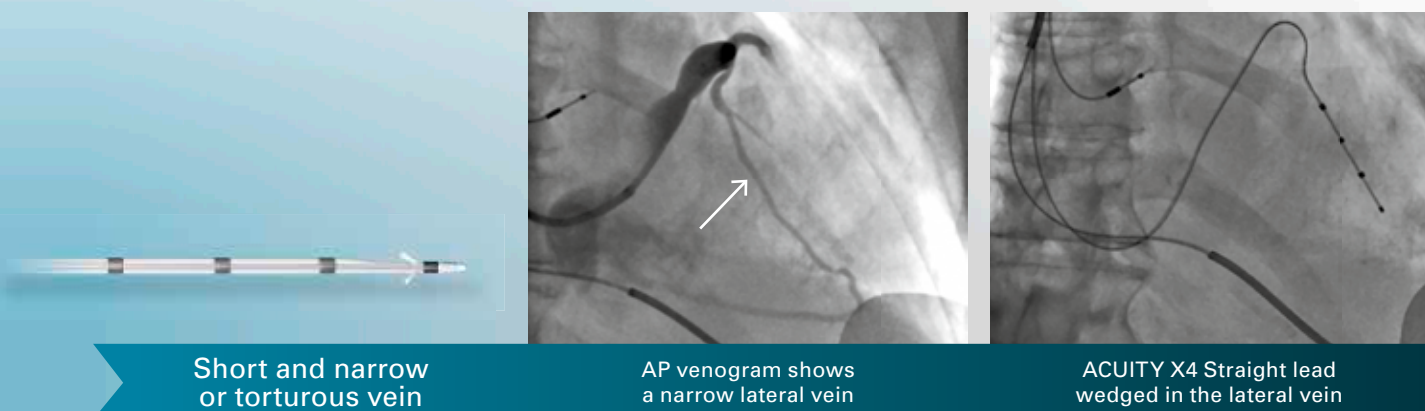
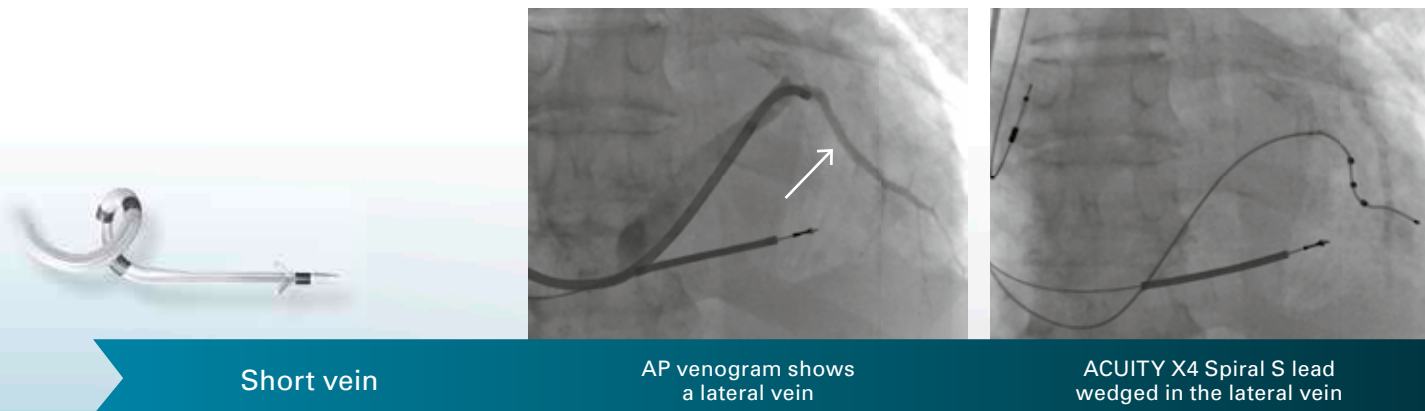
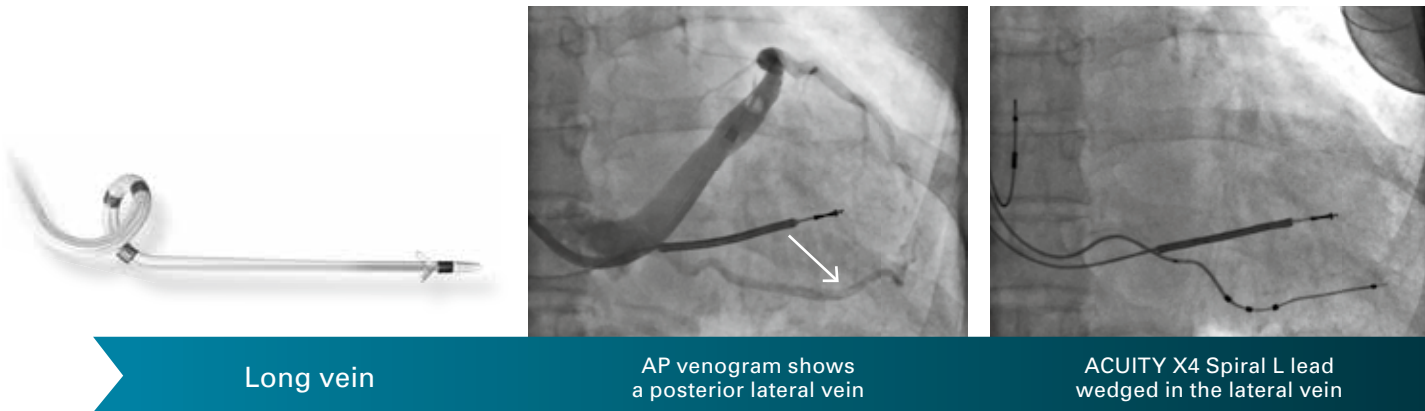
# Maximizing CRT Response

## ACUITY™ X4 Leads

for more non-apical pacing options

### DESIGNED FOR EASE OF IMPLANT AND REDUCED RISK OF RE-INTERVENTION

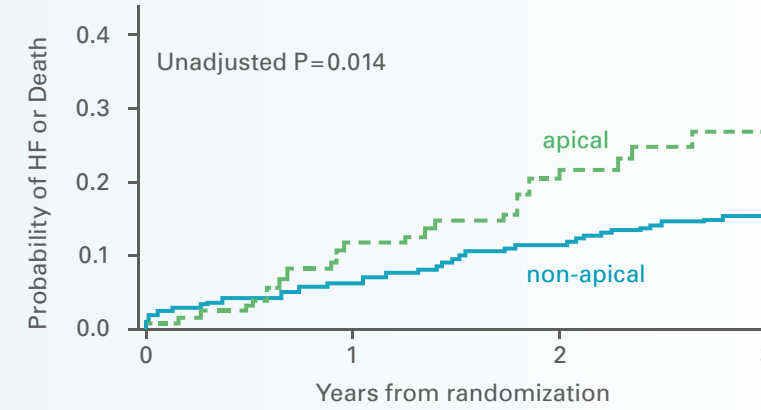
- 2.6F (0.86 mm) lead tip and 7F (2.33 mm) Inner Catheter delivery for direct access to small and tortuous branch vessels
- 3D Spiral with multiple electrodes to optimize stability and minimize pacing capture thresholds
- 3 electrode spacings to accommodate individual anatomy and to help you pace at your target location



Case courtesy of Dr. Christian Wollmann – University Hospital of St. Poelten – St. Poelten, Austria

**+ 72%**  
Increased risk for HF/death with Apical Pacing<sup>1</sup>

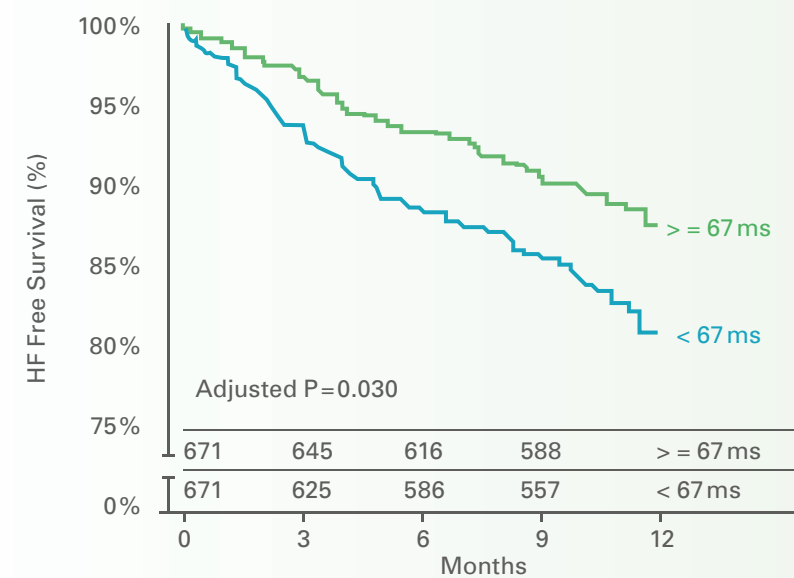
### “APICAL PACING SHOULD BE AVOIDED IN CRT”



Kaplan-Meier estimates of the probability of survival free of heart failure (HF) or death.

Singh J. et al., Circulation 2011;123:1159-1166 (n=799)

### “RV-LV DURATION PREDICTED THE CLINICAL RESPONSES TO CRT”



Kaplan-Meier curves of HF-Free Survival for the short and long RV-LV groups  
Gold M. et al., ESC 2014 (n=1342)<sup>2</sup>

**30%**

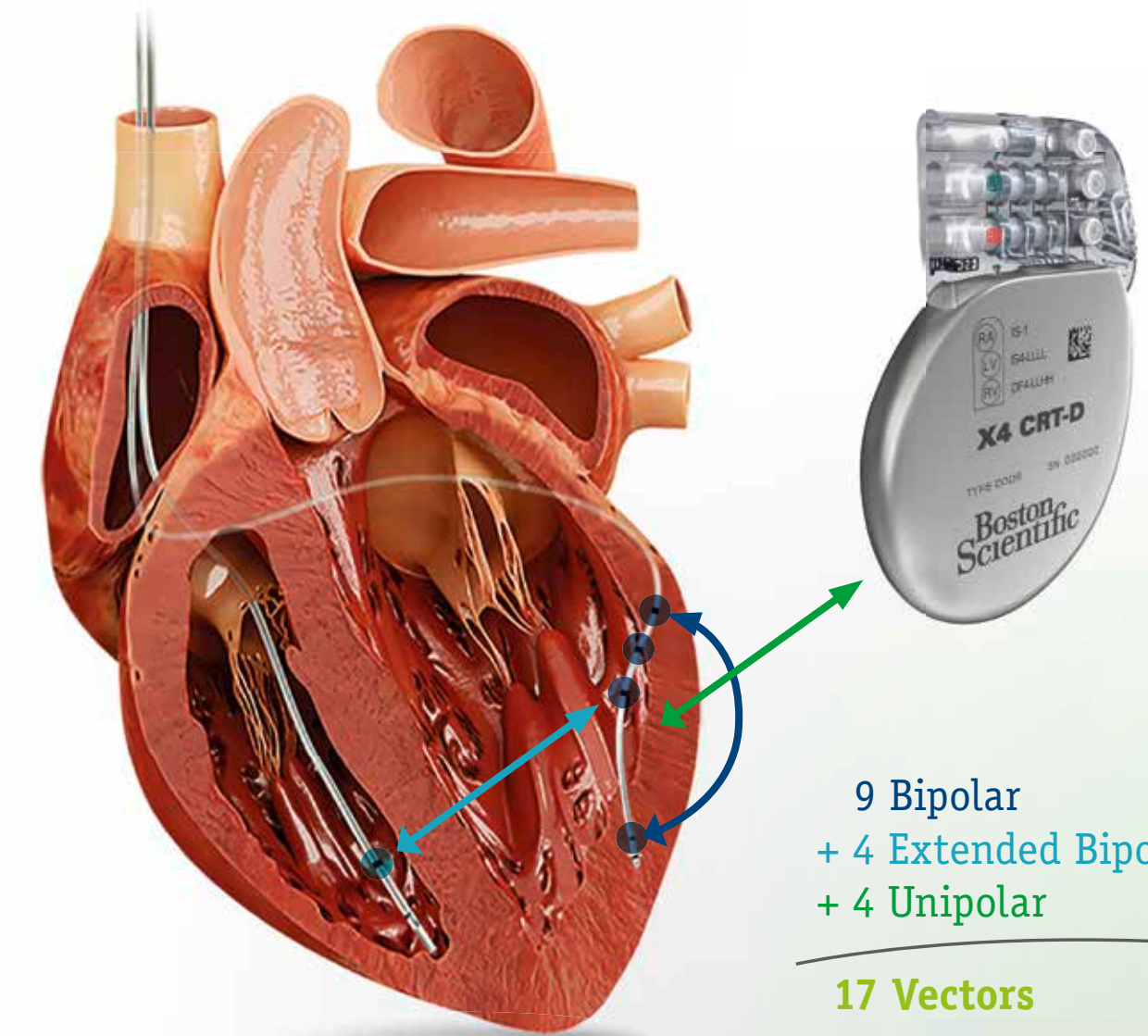
Reduction of Risk of HF hospitalization or death associated with longer RVS-LVS delay

## VectorGuide™

to identify the longest RV-LV sensing delay

### ONE CLICK FOR A POTENTIAL LIFETIME BENEFIT

- Studies have shown that most patients benefit from non-apical pacing<sup>3</sup>
- Patients ventricular activation patterns may vary considerably
- Longer electrical delay at pacing site has shown to reduce HF hospitalization and increase the number of responders<sup>4</sup>



VectorGuide™ is designed to quickly recommend the best of 17 vector options based on clinically relevant tests including RVS-LVS delay