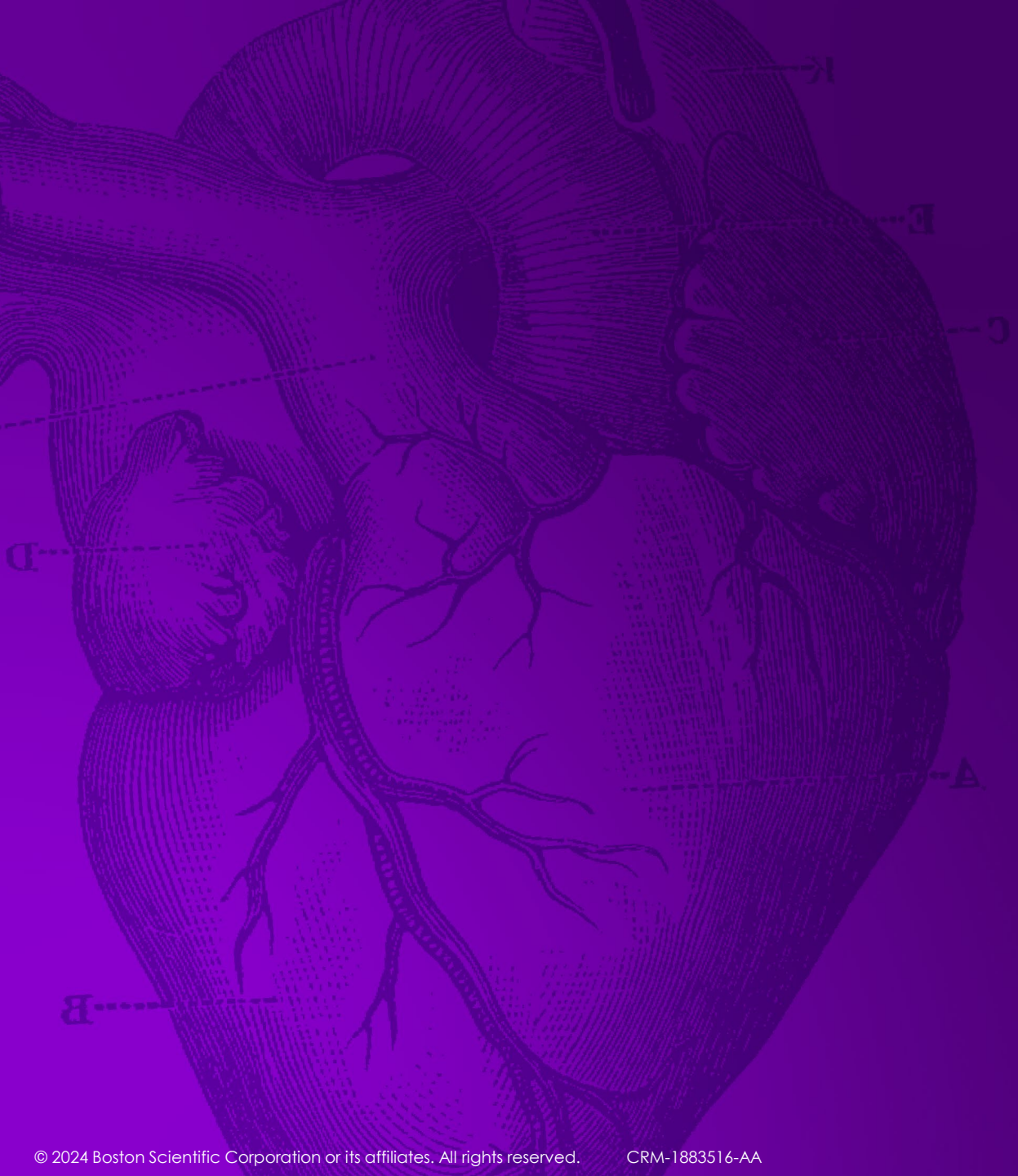

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Assessment of primary prevention patients receiving an ICD – Systematic evaluation of ATP: **APPRAISE ATP**

HRS Late Breaking Clinical Trials: LB-469803-02, 2024

 CRM-1883516-AA

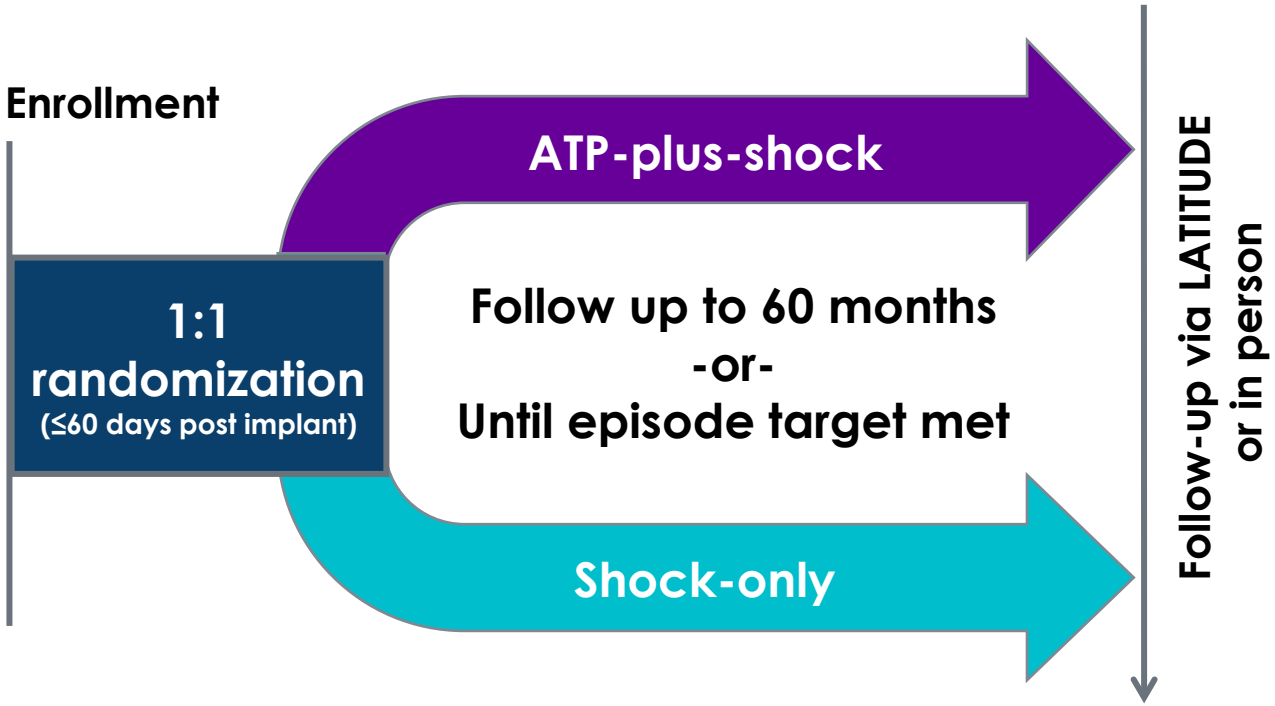
Background on ATP[1-7]

- Current Primary Prevention (PP) ICD programming guidelines come from large randomized clinical trials (MADIT-RIT, ADVANCE III, PROVIDE).
  - Safety and efficacy of increasing therapy rate cutoffs and/or prolonging the time from detection to therapy were tested in these large trials
  - Intention to reduce inappropriate and unnecessary therapy .
- These trial results are the foundation of the 2015 HRS/EHRA/APHRS/SOLAECE expert consensus statement about optimal ICD programming.
- PainFREE and PainFREE Rx II Trials
  - ATP as first line therapy to painlessly terminate ventricular arrhythmias was tested.
  - PainFREE Rx II published in 2004 remains the only prospective, randomized evaluation of ATP.
    - However, the patients studied were both primary and secondary prevention patients.
    - Devices programmed with a short delay before therapy and a therapy zone of 188-250 bpm .
- Multiple retrospective registries and nonrandomized observational studies support ATP in PP ICD patients who receive modern programming however, they lack uniform detection and therapy.

Clinical justification for evaluating ATP in Primary Prevention (PP) patients

- PainFREE RX II, the only prospective randomized trial of ATP in PP cohorts, likely overestimated the success of ATP by treating arrhythmias prematurely compared to current recommendations.[8]
- No prospective trial evaluating ATP as first line of therapy has been done with current guideline directed ICD programming (longer delay before therapy).[8]
- The emergence of the S-ICD that does not offer ATP at present, and the Substernal ICD where ATP has been associated with pain and discomfort[9,10], require the reevaluation of ATP for shared decision making in PP cohorts.[8]

Largest Prospective Randomized Trial of ATP and TV-ICD in Primary Prevention Patients[8,11]



- Prospective, multicenter, randomized trial
- Powered for 2600 primary prevention patients enrolled at up to 150 sites worldwide
- Equivalence trial with sequential superiority analysis of each arm

Primary Endpoint: Time to first all-cause shock

Secondary Endpoints: Time to first appropriate shock, time to first inappropriate shock, time to death from any cause, and time to first all-cause shock or death from any cause

Enrollment and Randomization[8,11]

PP ICD indicated patients received a Boston Scientific de novo single or dual chamber TV-ICD

Randomized 1:1 (n=2,595)

Arm 1: ATP ON or ATP-plus-Shock (n=1302)

Arm 1 Programming

- **Zone 1:** 170 bpm, monitor only
- **Zone 2:** 200 bpm, 12 sec delay, ATP x1 burst of 8 pulses, 41 J shock
- **Zone 3:** 250 bpm, 5 sec delay, 41 J shock

Arm 2: ATP OFF or Shock Only (n=1293)

Arm 2 Programming

- **Zone 1:** 170 bpm, monitor only
- **Zone 2:** 200 bpm, 12 sec delay, 41 J shock
- **Zone 3:** 250 bpm, 5 sec delay, 41 J shock

Required contemporary programming[8,†]

Zone1: VT-1 Zone (170-199 bpm)

Both Arms — ***Monitor Only***

Zone 2: VT Zone (200-249 bpm)

ATP = one burst of 8 beats at 88% CL

Detection 2 sec

ATP-plus-shock Arm
~3 second longer delay*

Deliver Shock (if necessary)

Shock-only Arm

Deliver Shock

Zone 3: VF Zone (≥250 bpm)

Detection 2 sec

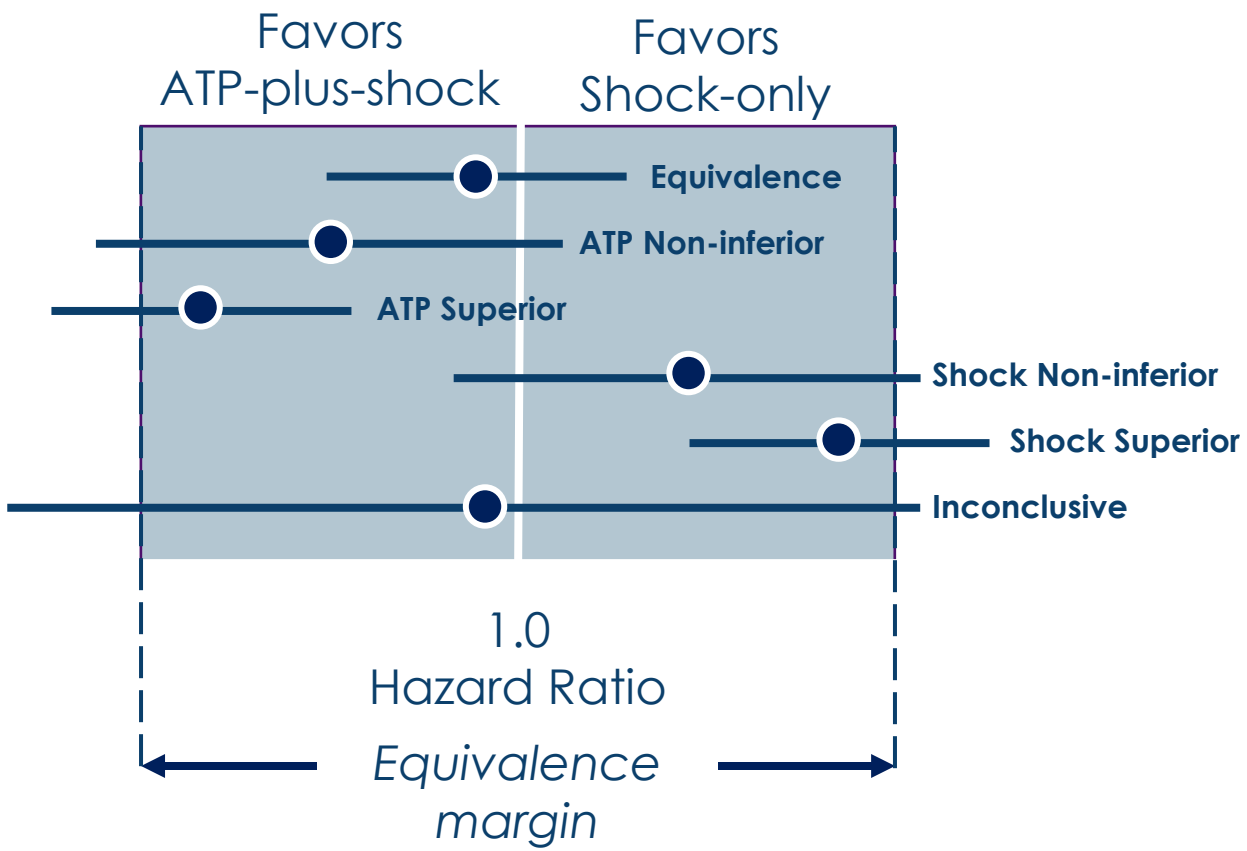
Both Arms

Deliver Shock

† Per protocol, device programming could be changed at the investigator's discretion following a patient's first shock (appropriate or inappropriate).
* Unknown at this time if this additional delay impacted primary endpoint. The APPRAISE ATP chose this programming option vs shortening delay in shock-only arm to avoid concern that the programming was biased in favor of the Shock-only arm.

How was the primary endpoint evaluated?[8]

- Powered for equivalence between arms with interim superiority analysis when pre-specified numbers of shock episodes occurred.
- 284 subjects with a shock therapy episode needed to power the primary endpoint of time to first all-cause shock.
- All arrhythmia events were adjudicated by an independent committee.



Inclusion and Exclusion Criteria[8]

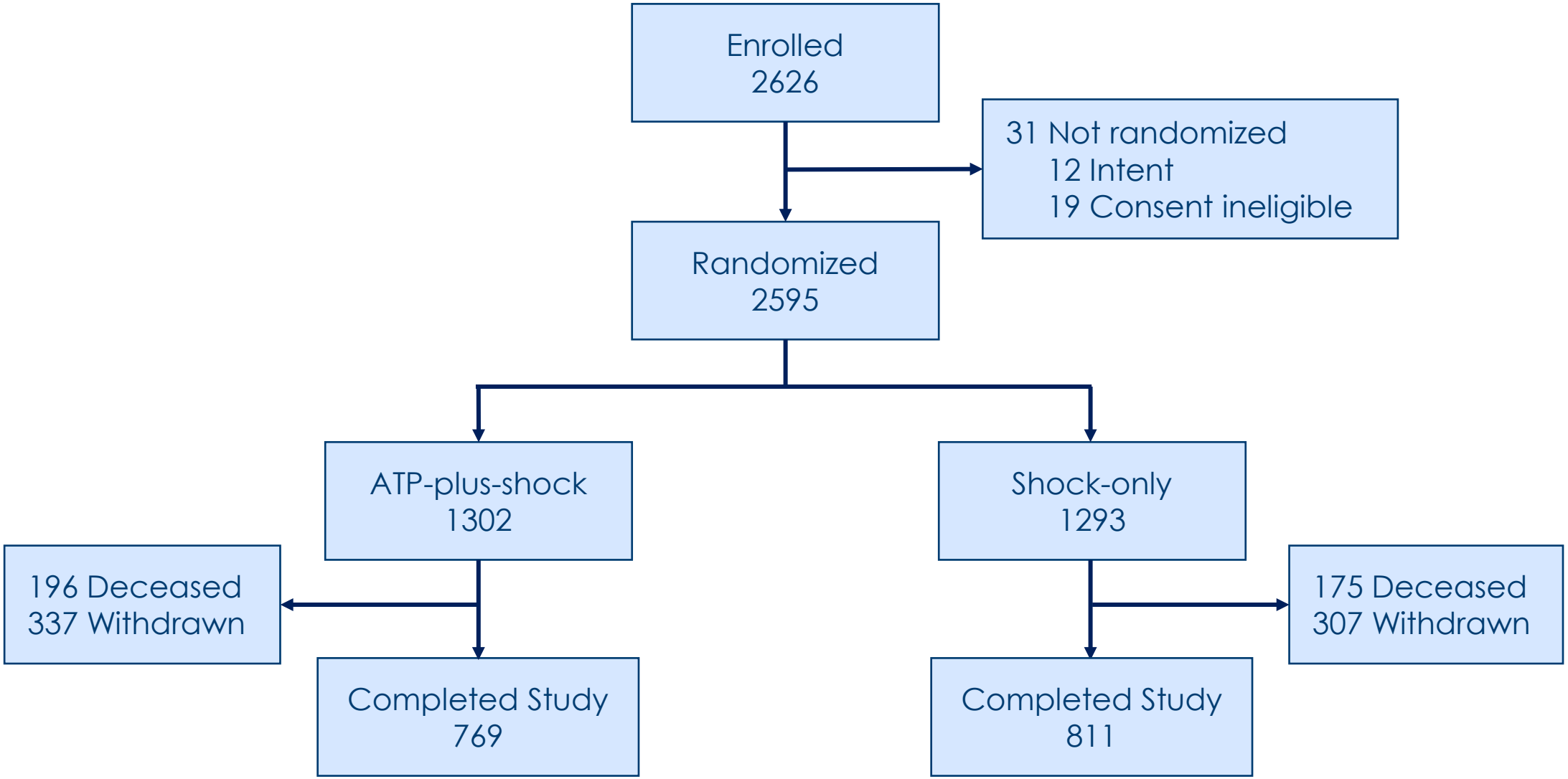
Inclusion:

- Transvenous ICD implanted within 60 days of enrollment due to:
  - Prior MI with LVEF ≤ 30% OR ischemic or non-ischemic cardiomyopathy and LVEF ≤ 35% and NYHA class II or III
  - ≥ 21 years of age

Exclusion:

- History of spontaneous sustained VT (≥ 160 bpm at ≥ 30 seconds in duration) or VF not due to a reversible cause
- NYHA Class IV within 90 days prior to enrollment
- Scheduled for cardiac resynchronization implant
- On active heart transplant list
- Previous subcutaneous ICD (S-ICD) or existing TV-ICD device implanted for greater than 60 days
- Coronary artery bypass graft surgery or percutaneous coronary intervention within 90 days prior to enrollment
- Documented MI within 90 days prior to enrollment
- Has a VAD or is to receive VAD
- Life expectancy shorter than 18 months due to any medical condition (e.g., cancer, uremia, liver failure, etc.)
- Hemodialysis

Patient Flowchart[11]

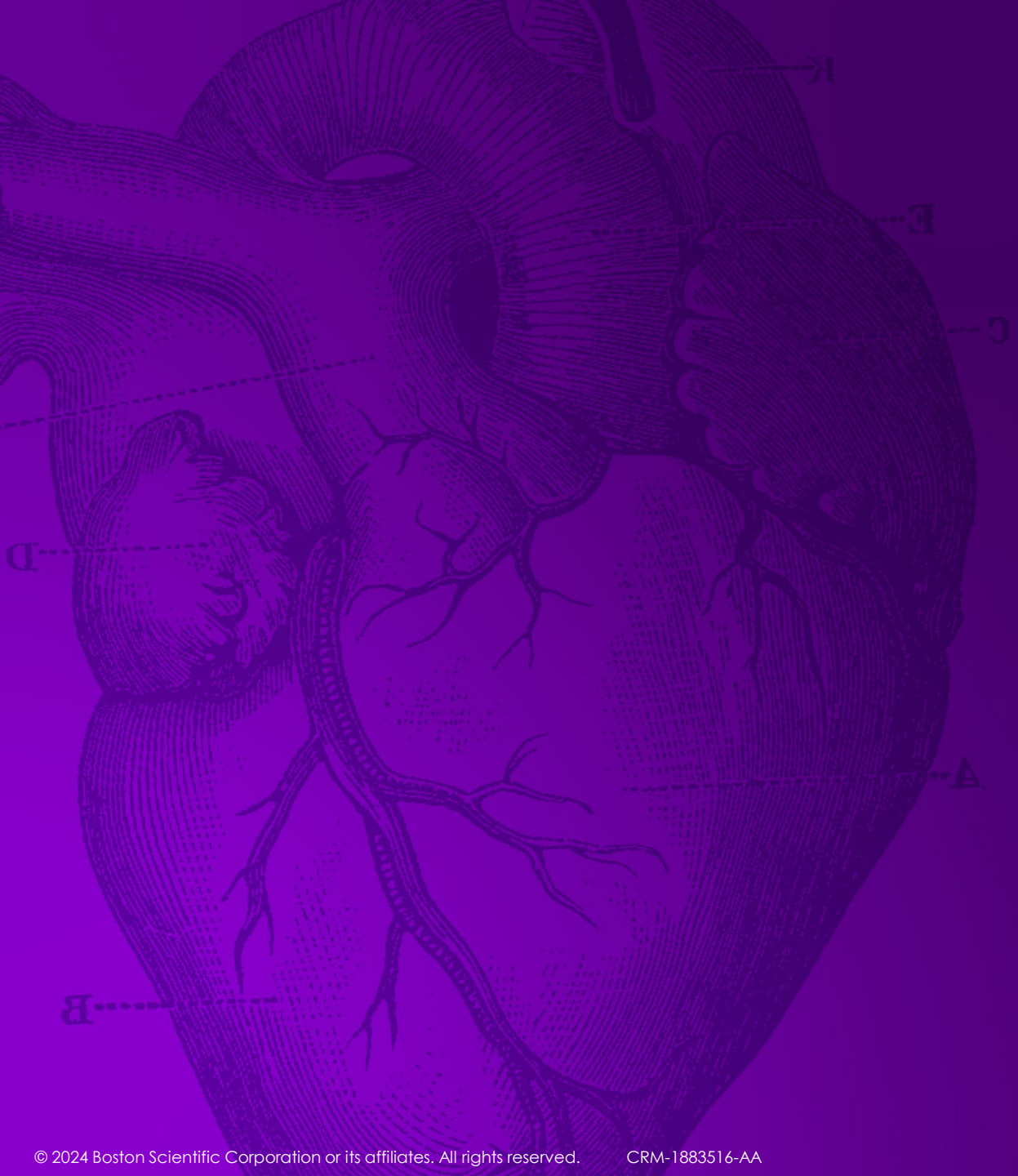


Typical Primary Prevention Patients[11]

The APPRAISE ATP Trial included a **typical Primary Prevention population** with a **mean age of 64** and a **high percent had ischemic cardiomyopathy and a mean EF of 27%**[11]

Characteristic	ATP-shock (N=1302)	Shock-only (N=1293)
Mean age ± SD — years	64.0 ± 11.5	63.8 ± 11.1
Female sex — no. (%)	277 (21.3)	304 (23.5)
Ischemic etiology — no. (%)	757 (58.1)	753 (58.2)
Mean follow-up duration ± SD — months	37.4 ± 16.9	38.6 ± 16.5
Race or ethnic group* — no. (%)		
American Indian or Alaska Native	5 (0.4)	8 (0.6)
Asian	209 (16.3)	206 (16.2)
Black or African heritage	169 (13.2)	178 (14.0)
Caucasian	860 (67.2)	849 (66.8)
Hispanic or Latino	39 (3.0)	37 (2.9)
Native Hawaiian or other Pacific Islander	2 (0.2)	3 (0.2)
Other race	3 (0.2)	1 (0.1)
Not disclosed	22 (1.7)	22 (1.7)
Device type		
Single chamber ICD — no. (%)	678 (52.2)	646 (50.0)
Dual chamber ICD — (%)	622 (47.8)	646 (50.0)

Characteristic	ATP-shock (N=1302)	Shock-only (N=1293)
Mean LV ejection fraction ± SD — %	27.4 ± 6.2	27.1 ± 6.0
Mean QRS duration ± SD — msec	107 ± 21	108 ± 21
NYHA class — no. (%)		
I or II	913 (70.3)	932 (72.2)
III or IV	385 (29.7)	359 (27.8)
Mean body mass index (BMI) ± SD — kg/m^2	29.3 ± 7.1	29.2 ± 6.8
Hypertension	928 (71.7)	914 (71.1)
Current or previous smoking — no./total no. (%)	753/1298 (58.0)	771/1291 (59.8)
Diabetes — no. (%)	525 (40.3)	520 (40.2)
Previous coronary artery bypass graft — no. (%)	271 (20.9)	289 (22.4)
History of atrial fibrillation — no. (%)	341 (26.2)	356 (27.5)
QRS morphology — no./total no. (%)		
Normal	633/973 (65.1)	631/960 (65.7)
Right bundle branch block (RBBB)	72/973 (7.4)	63/960 (6.6)
Left bundle branch block (LBBB)	42/973 (4.3)	46/960 (4.8)
Other	226/973 (23.2)	220/960 (22.9)
LATITUDE remote monitoring usage — no. (%)	983 (75.5)	968 (74.9)



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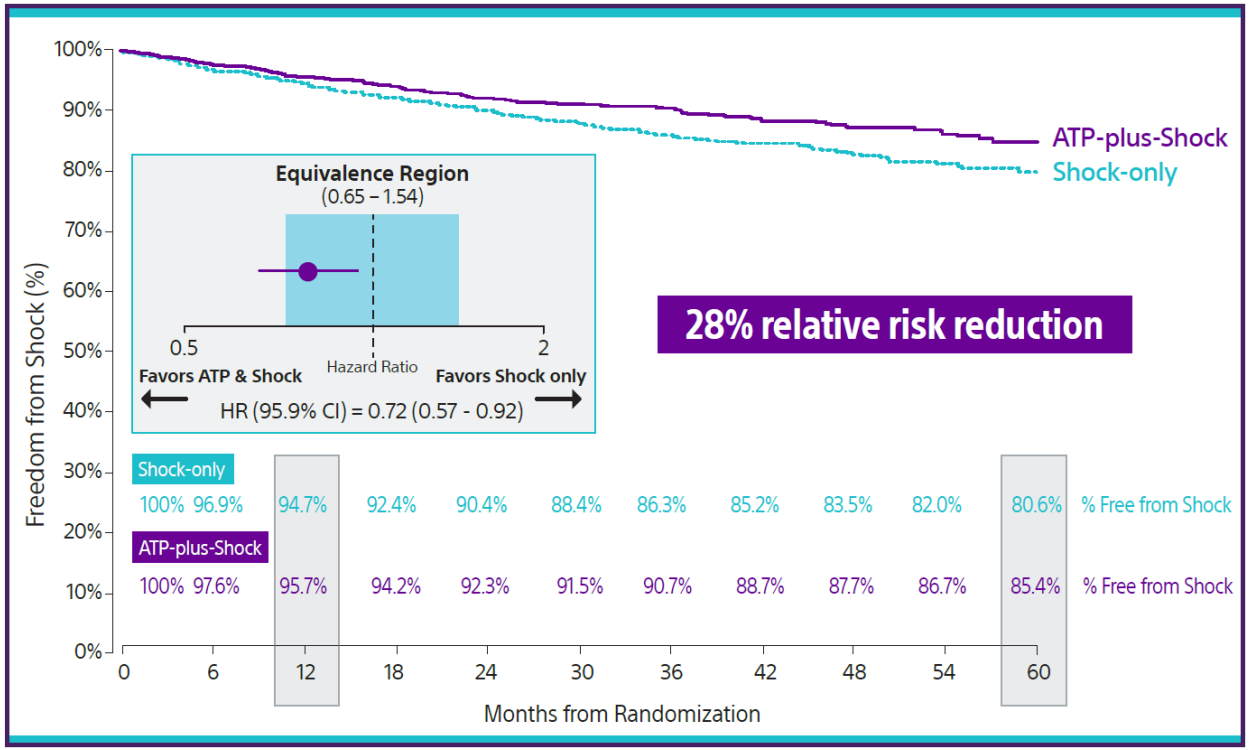
Results from the APPRAISE ATP Trial

CRM-1883516-AA

Primary Endpoint: Time to First All-Cause Shock[11]

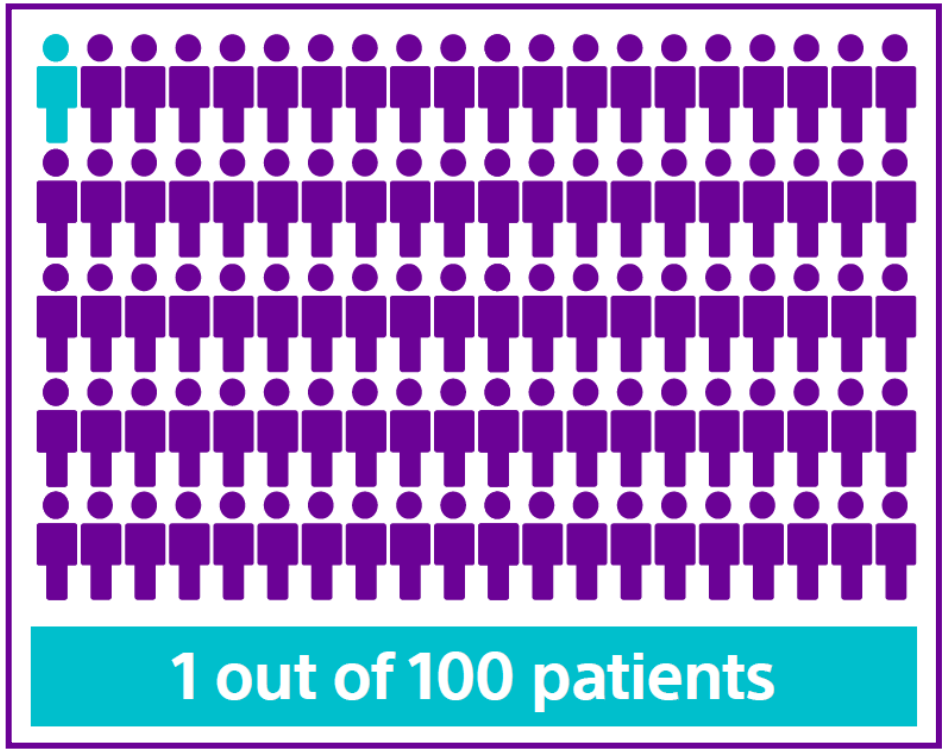
Relative Risk

The APPRAISE ATP trial demonstrated superiority with a **28% relative risk reduction** in time to first all-cause shock for the ATP ON arm compared to the ATP OFF arm (Log-rank P-value=0.005).[11]



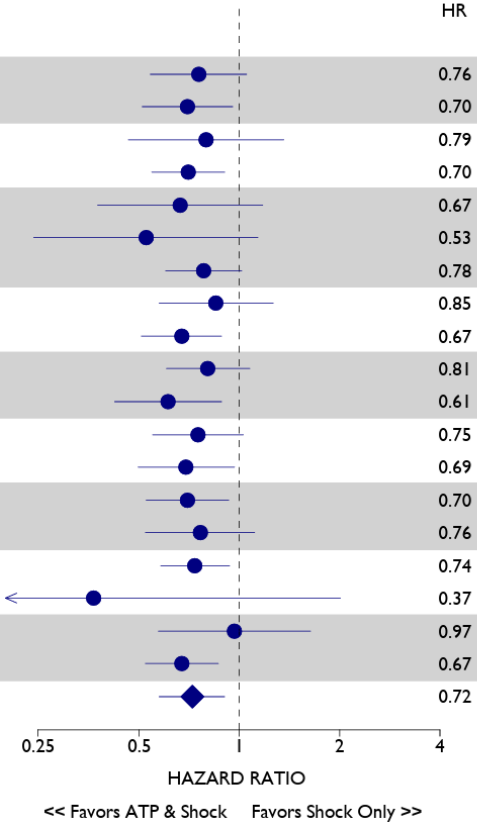
Absolute Risk

This represents an absolute all-cause shock reduction in **1% of primary prevention ICD indicated patients/year**.[11]



The benefit of ATP-plus-shock therapy in TV-ICDs was similar across all subgroups including patients with ischemic cardiomyopathy (ICM)[11]

CHARACTERISTIC	SUBGROUP	N	HR	95% CI	P	Interaction P
Age	>= 65 years	1337	0.76	0.54-1.05	0.097	0.74
	< 65 years	1257	0.70	0.51-0.96	0.025	
Sex	Female	581	0.79	0.46-1.36	0.40	0.68
	Male	2013	0.70	0.55-0.90	0.006	
Geography	Asia Pacific	377	0.67	0.38-1.18	0.16	0.58
	Europe	245	0.53	0.24-1.14	0.10	
	North America	1956	0.78	0.60-1.02	0.070	
Indication	MI and EF <= 30%	862	0.85	0.57-1.26	0.42	0.36
	NYHA II/III and EF <= 35%	1718	0.67	0.51-0.89	0.005	
History of AF	No	1898	0.81	0.60-1.08	0.14	0.25
	Yes	697	0.61	0.42-0.89	0.009	
Ischemic Etiology	Ischemic	1510	0.75	0.55-1.03	0.074	0.72
	Non-ischemic	1085	0.69	0.50-0.97	0.030	
Diabetes	No	1550	0.70	0.53-0.93	0.015	0.72
	Yes	1045	0.76	0.53-1.11	0.16	
Pre-Implant EP Testing	No	2356	0.74	0.58-0.94	0.013	0.47
	Yes	57	0.37	0.07-2.01	0.25	
Followed on LATITUDE	No	644	0.97	0.57-1.64	0.91	0.21
	Yes	1951	0.67	0.52-0.87	0.002	
Overall		2595	0.72	0.58-0.91	0.005	

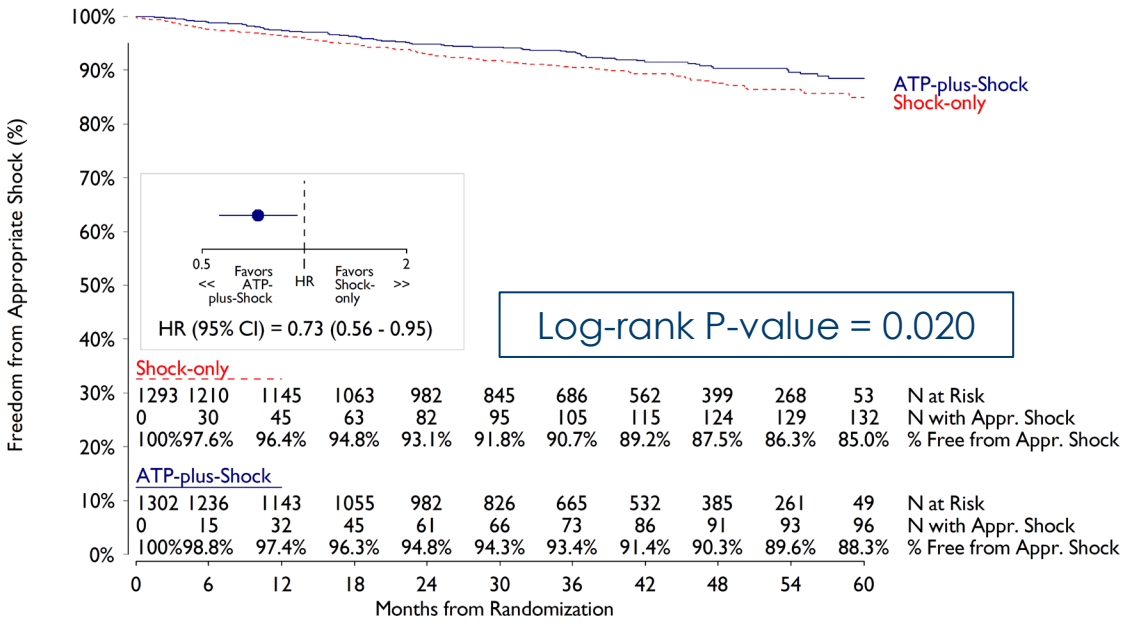


No significant interactions between randomization group and baseline characteristics[11]

- 58% of patients had ICM.[11]
  - ICM patients were not any more likely to benefit from ATP than patients with non-ischemic cardiomyopathy (NICM).[11]
- Only 1% (1 out of 100) of ICD-indicated PP patients with ICM will avoid a shock each year after TV-ICD implant.[11]

While rates of Appropriate Shocks were significantly different throughout follow-up (p=0.020), <1% per year avoided an appropriate shock in the ATP ON arm[11]

Time to First Appropriate Shock



27% lower risk of an appropriate shock in ATP-plus-shock group[11]

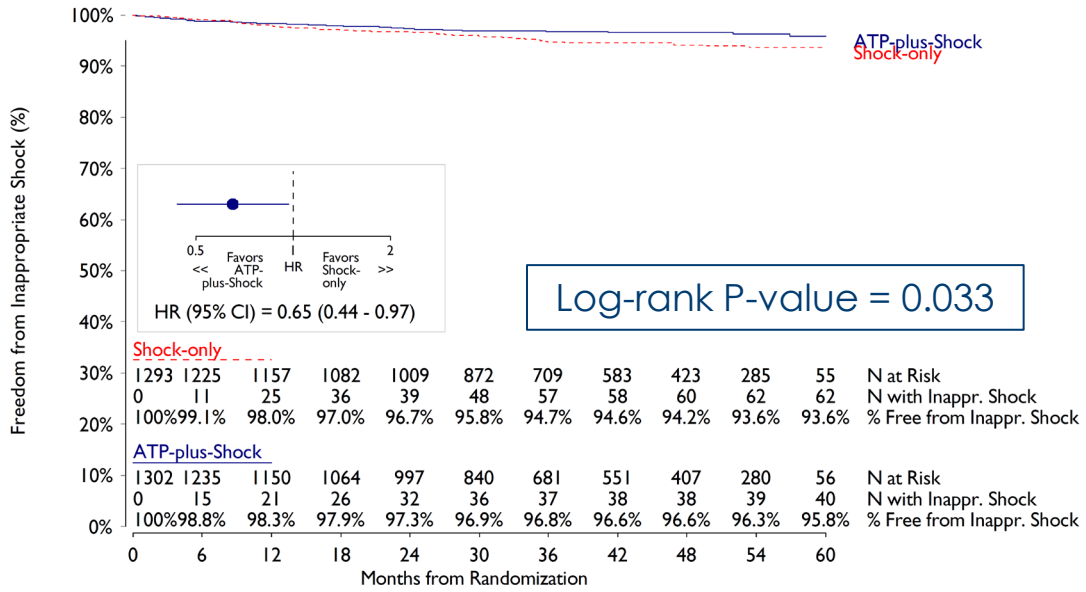
- Percent of patients free from appropriate shocks[11]:
  - **At 1 year:** 97.4% for the ATP-plus shock arm vs 96.4% for the shock-only arm.
  - **At 5 years:** 88.3% for the ATP-plus-shock arm vs 85.0% for the shock-only arm.
- The absolute differences at 1 year and 5 years were 1% and 3.3% of patients, respectively.[11]

97.4% ATP ON	96.4% ATP OFF	88.3% ATP ON	85.0% ATP OFF

While rates of Inappropriate Shocks were significantly different throughout follow-up (p=0.033), ~0.5% of patients per year avoided an inappropriate shock in the ATP ON arm[11]

- Percent of patients free from inappropriate shocks[11]:
  - **At 1 year:** 98.3% for the ATP-plus-shock arm vs 98.0% for the shock-only arm.
  - **At 5 years:** 95.8% for the ATP-plus-shock arm vs 93.6% for the shock-only arm.
- IAS rates in both arms were low due to the use of guideline recommended programming.[11]
- The absolute differences at 1 year and 5 years were 0.3% and 2.2% of patients, respectively.[11]

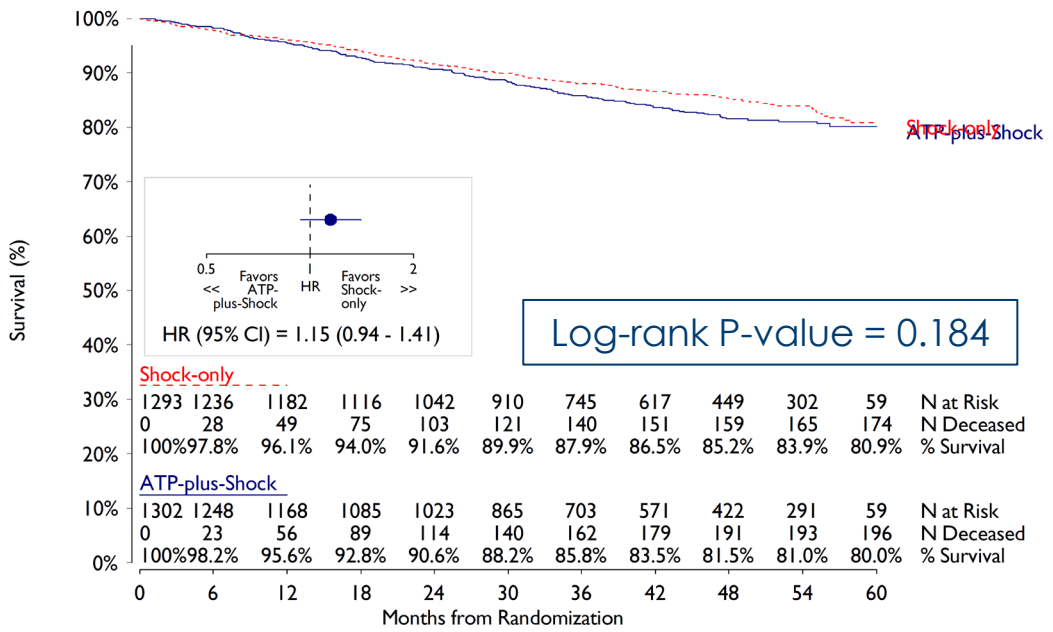
Time to First Inappropriate Shock



35% lower risk of an inappropriate shock in ATP-plus-shock group[11]

Deaths from any cause were numerically higher in the ATP-plus-shock arm, however, there was no significant difference in deaths between the TV-ICD programming arms (HR: 1.15, p=0.184)[11]

All-Cause Mortality

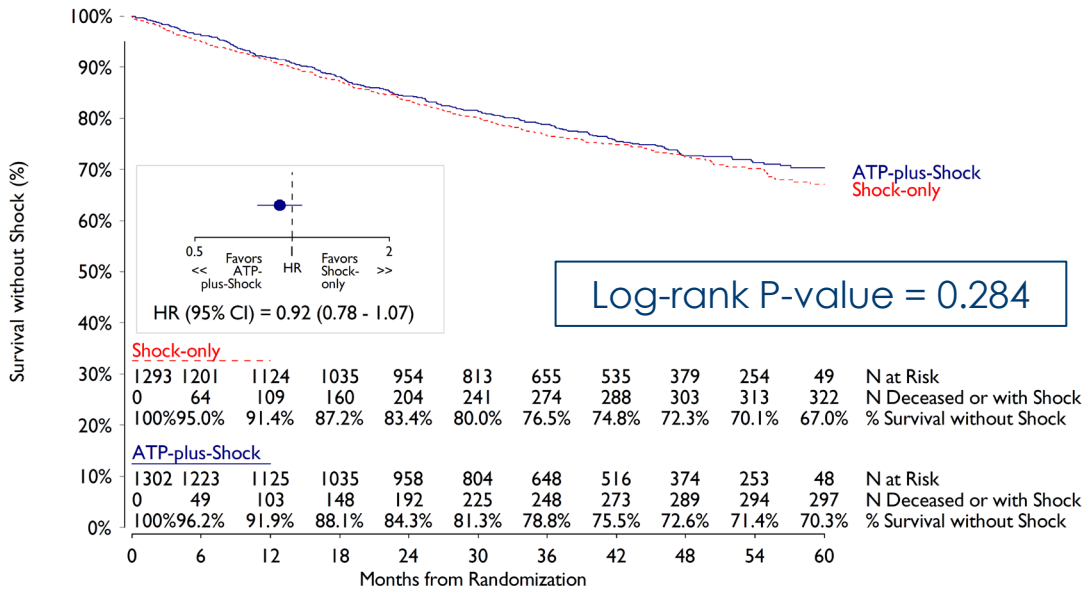


No significant difference between groups[11]

This finding demonstrates there was no signal that shock-only increased mortality or that ATP decreased mortality.[11]

There was no significant difference in the combined endpoint of time to first all-cause shock or death between the ATP-plus-shock arm and shock-only arm (HR: 0.92, p=0.284)[11]

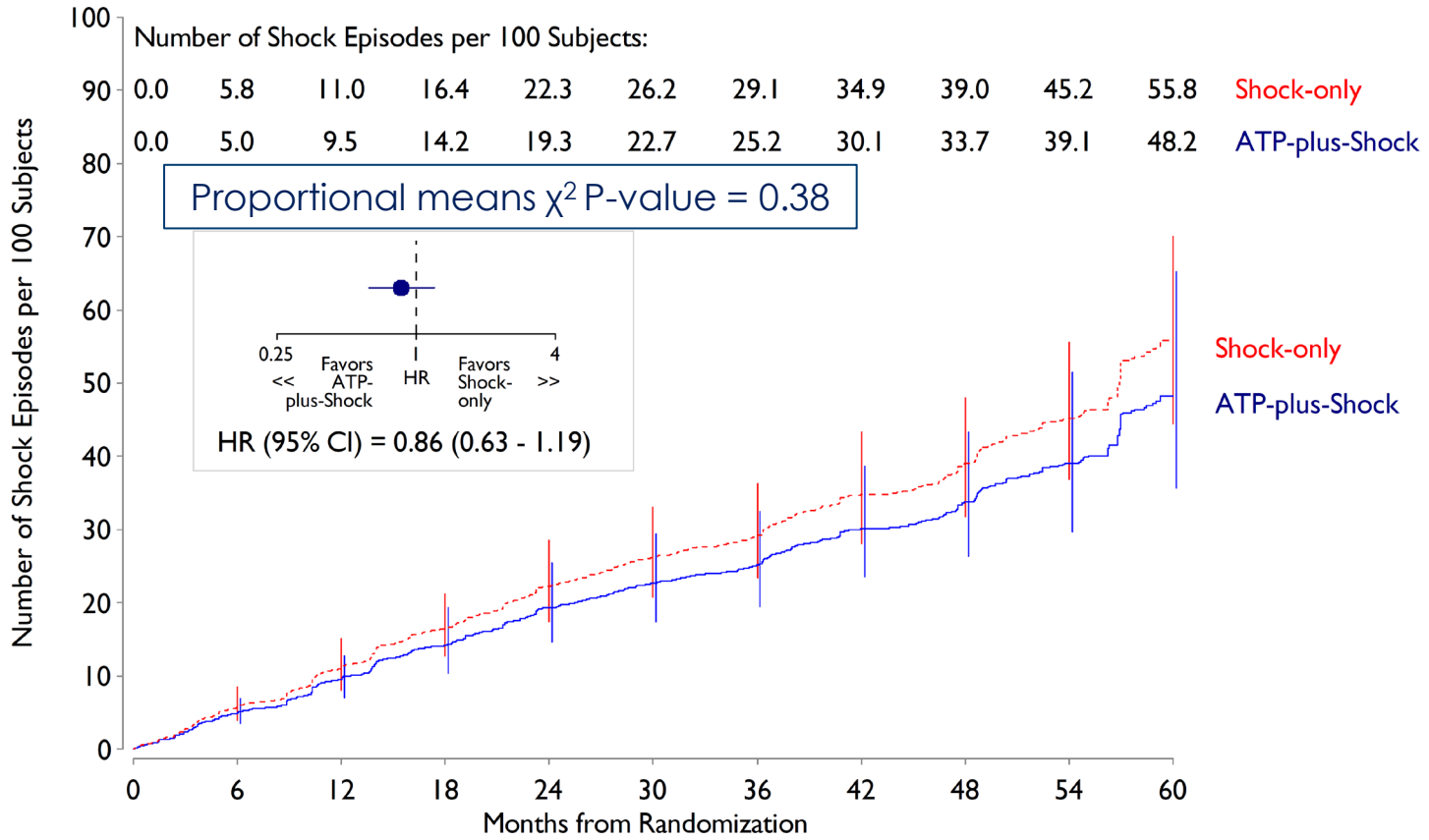
Time to First All-Cause Shock or Death



No significant difference between groups[11]

The numerically higher deaths in the ATP-plus-shock arm was enough to cancel the benefit of ATP for the composite endpoint of time to first all cause shock or death.[11]

No significant difference in total all-cause shock burden (p=0.38)[11]

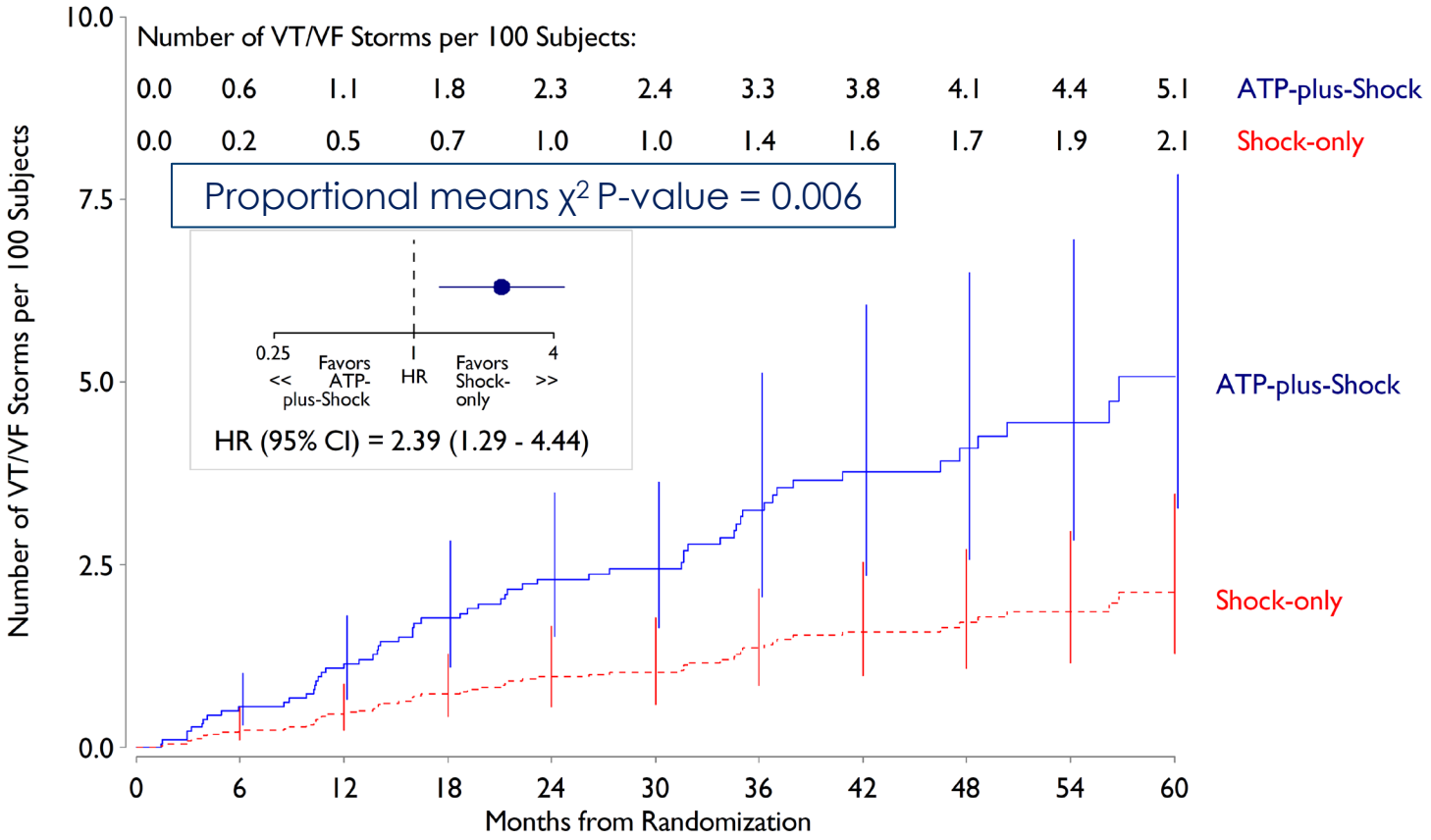


Finding driven primarily by patients with multiple interventions[11]

This finding suggests that even though programming with ATP prolonged time to first shock for patients in the ATP-plus-shock arm, the total amount of shocks over the duration of follow-up in the two groups was not significantly different.[11]

The ATP-plus-shock arm was more than twice as likely to experience VT/VF storms than the shock-only arm[11]

- During the follow-up period, there was a significant increased risk of all VT/VF storm events for the ATP-plus-shock arm (p=0.006).[11]
- VT/VF storm events possibly occurred because reprogramming was allowed after the patient experienced a shock.[11]
- **Important to note[11]:** This does not prove ATP causes more VT/VF storm events, but the association is interesting and will be evaluated further in future publications.



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Importance of Shared Decision Making

- Primary prevention patients eligible for an S-ICD should know the lifetime risks as well as the benefits of the transvenous ICD.[11,12-15]
- The benefit of ATP should also be compared to the lifetime risk of having a lead in the heart with a TV-ICD.[12-15]

Conclusions and Summary[11]

- A single burst of ATP prior to shock in the VT zone (200-249 bpm) resulted in a relative risk reduction in time to first all-cause shock by 28% (HR 0.72, CI 0.57-0.92, p=0.005), representing an absolute reduction of 1% per year for the study population.
- No significant interactions between any prespecified patient subgroup and the primary endpoint were found, implying that all PP patients responded similarly to their assigned study arm.
- The total shock burden per 100 subjects was not statistically different (HR 0.86, CI 0.63-1.19, p=0.38).
- The risk of VT/VF storm events was significantly greater in the ATP-plus-shock arm (HR 2.39, CI 1.29-4.44, p=0.006).
- Although not statistically significant, there were numerically more deaths in the ATP-plus-shock arm and the composite endpoint of all-cause shocks and death was non-significant.
- These results should be carefully considered in the shared decision-making of selecting ICD technologies in PP populations.

Summary: Across five years of follow up, data demonstrated a statistically significant, but small absolute first all-cause shock reduction in only 1% of patients per year. Shock burden, or the number of shocks experienced by a patient, was not significantly different between the two arms, and the majority of patients did not require ATP therapy.[18]

mCRM™ System* – designed for the future of personalized patient care

- Upon the EMPOWER™ Leadless Pacemaker* and mCRM system receiving FDA approval, EMPOWER will be the first and only LP designed to be a standalone VVIR pacemaker** that is compatible with all existing EMBLEM™ S-ICD devices as part of the mCRM system.[16]
- Will provide an upgrade pathway to patients with an EMBLEM S-ICD who develop a need for ATP or VVIR pacing.[16]
- Designed to deliver painless intracardiac ATP and/or brady pacing.[16,17]
- Designed to provide upgrade pathways regardless if the EMBLEM S-ICD or EMPOWER LP is implanted first.[16]

* Caution: Investigational Device. Limited by US law to investigational use only. Not available for sale.
** Rate-response results will be reported in a future publication.

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Practical implications of MODULAR & APPRAISE ATP Trials[18]

"Together, data from the MODULAR ATP and APPRAISE ATP trials reinforce the promise of the groundbreaking mCRM System, illustrating a clear path forward for physicians to offer therapies that prevent sudden cardiac death and deliver ATP for the small number of patients who benefit from it."

"Instead of subjecting all patients to the risks of more invasive approaches, such as placing leads in the heart or tunneling them under the sternum to provide therapies they might not require, these data indicate physicians may have the opportunity to tailor therapy to the patient's individual needs and health."

- Ken Stein MD, Global Chief Medical Officer BSC

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ICD Systems –AUTOGEN™ EL, DYNAGEN™ EL, DYNAGEN™ MINI, INOGEN™ EL, INOGEN™ MINI, ORIGEN™ EL, ORIGEN™ MINI, INCEPTA™, ENERGEN™, PUNCTUA™, TELIGEN™100

CAUTION: Federal law (USA) restricts this device to sale by or on the order of a physician. Rx only. Prior to use, please see the complete "Directions for Use" for more information on Indications, Contraindications, Warnings, Precautions, Adverse Events, and Operator's Instructions.

INDICATIONS AND USAGE
Boston Scientific implantable cardioverter defibrillators (ICDs) are intended to provide ventricular antitachycardia pacing (ATP) and ventricular defibrillation for automated treatment of life-threatening ventricular arrhythmias.

CONTRAINDICATIONS
Use of these Boston Scientific pulse generators are contraindicated for the following: patients whose ventricular tachyarrhythmias may have reversible cause, such as: digitalis intoxication, electrolyte imbalance, hypoxia, sepsis; or patients whose ventricular tachyarrhythmias have a transient cause, such as: acute myocardial infarction (MI), electrocution, drowning; or patients who have a unipolar pacemaker.

WARNINGS
Read this manual thoroughly before implantation to avoid damage to the pulse generator and/or lead. For single patient use only. Do not reuse, reprocess, or resterilize. Always have external defibrillation equipment available during implant and electrophysiologic testing. Ensure that an external defibrillator and medical personnel skilled in CPR are present during post-implant device testing should the patient require external rescue. Do not use this pulse generator with another pulse generator. Program the pulse generator Tachy Mode(s) to Off during implant, explant, or postmortem procedures to avoid inadvertent high voltage shocks. Do not kink, twist, or braid the lead with other leads as doing so could cause lead insulation abrasion damage or conductor damage. For leads that require the use of a Connector Tool, use caution handling the lead terminal when the Connector Tool is not present on the lead. Do not directly contact the lead terminal with any surgical instruments or electrical connections such as PSA (alligator) clips, ECG connections, forceps, hemostats, and clamps. Do not contact any other portion of the DF4–LLHH or DF4–LLHO lead terminal, other than the terminal pin, even when the lead cap is in place. Do not use atrial tracking modes in patients with chronic refractory atrial tachyarrhythmias. Tracking of atrial arrhythmias could result in ventricular tachyarrhythmias. Advise patients to seek medical guidance before entering environments that could adversely affect the operation of the active implantable medical device, including areas protected by a warning notice that prevents entry by patients who have a pulse generator. AUTOGEN, DYNAGEN, INOGEN, and ORIGEN devices are considered MR Conditional. For these devices, unless all of the MRI Conditions of Use are met, MRI scanning of the patient does not meet MR Conditional requirements for the implanted system. Significant harm to or death of the patient and/or damage to the implanted system may result. For potential adverse events applicable when the Conditions of Use are met or not met, refer to the MRI Technical Guide. All other devices covered by this statement are not MR conditional. Do not expose a patient with non-MR conditional devices to MRI scanning. Do not subject a patient with an implanted pulse generator and/or lead to diathermy. If desired, ensure that Patient Triggered Monitor is enabled prior to sending the patient home. Once the Patient Triggered Monitor feature has been triggered by the magnet and an EGM has been stored, or after 60 days have elapsed from the day that Store EGM was enabled, the patient should not apply the magnet.

PRECAUTIONS
For specific information on precautions, refer to the following sections of the product labeling: clinical considerations, sterilization and storage, implantation, device programming, environmental and medical therapy hazards, hospital and medical environments, home and occupational environments, follow up testing, explant and disposal, supplemental precautionary information.

POTENTIAL ADVERSE EVENTS
Based on the literature and on pulse generator and/or lead implant experience, the following alphabetical list includes the possible adverse evets associated with the included devices: Air embolism; Allergic reaction; Bleeding; Bradycardia; Cardiac tamponade; Chronic nerve damage; Component failure; Conductor coil fracture; Death; Elevated thresholds; Erosion; Excessive fibrotic tissue growth; Extracardiac stimulation (muscle/nerve stimulation); Failure to convert an induced arrhythmia; Fluid accumulation; Foreign body rejection phenomena; Formation of hematomas or seromas; Heart block; Heart failure following chronic RV apical pacing; Inability to defibrillate or pace; Inappropriate therapy (e.g., shocks and antitachycardia pacing (ATP) where applicable, pacing);; Incisional pain; Incomplete lead connection with pulse generator; Infection including endocarditis; Lead dislodgement; Lead fracture; Lead insulation breakage or abrasion; Lead perforation; Lead tip deformation and/or breakage; Local tissue reaction; Loss of capture; Myocardial infarction (MI); Myocardial necrosis; Myocardial trauma (e.g., tissue damage, valve damage); Myopotential sensing; Oversensing/undersensing; Pacemaker-mediated tachycardia (PMT)(Applies to dual-chamber devices only); Pericardial rub, effusion; Pneumothorax; Pulse generator migration; Shunting current during defibrillation with internal or external paddles; Syncope; Tachyarrhythmias, which include acceleration of arrhythmias and early, recurrent atrial fibrillation; Thrombosis/thromboemboli; Valve damage; Vasovagal response; Venous occlusion; Venous trauma (e.g., perforation, dissection, erosion); Worsening heart failure.

For a list of potential adverse events associated with MRI scanning, refer to the ImageReady MR Conditional Defibrillation System MRI Technical Guide

Patients may develop psychological intolerance to a pulse generator system and may experience the following: Dependency; Depression; Fear of premature battery depletion; Fear of shocking while conscious; Fear that shocking capability may be lost; Imagined shocking; Fear of a device malfunction.

92436232 Rev A

 CRM-1883516-AA

ICD Systems –RESONATE™ HF, RESONATE™ EL, PERCIVA™ HF, PERCIVA™, VIGILANT™ EL, MOMENTUM™ EL

CAUTION: Federal law (USA) restricts this device to sale by or on the order of a physician. Rx only. Prior to use, please see the complete "Directions for Use" for more information on Indications, Contraindications, Warnings, Precautions, Adverse Events, and Operator's Instructions.

INDICATIONS AND USAGE
Boston Scientific implantable cardioverter defibrillators (ICDs) are intended to provide ventricular antitachycardia pacing (ATP) and ventricular defibrillation for automated treatment of life-threatening ventricular arrhythmias.

CONTRAINDICATIONS
Use of these Boston Scientific pulse generators are contraindicated for the following: patients whose ventricular tachyarrhythmias may have reversible cause, such as: digitalis intoxication, electrolyte imbalance, hypoxia, sepsis; or patients whose ventricular tachyarrhythmias have a transient cause, such as: acute myocardial infarction (MI), electrocution, drowning; or patients who have a unipolar pacemaker.

WARNINGS
Read this manual thoroughly before implantation to avoid damage to the pulse generator and/or lead. For single patient use only. Do not reuse, reprocess, or resterilize. Always have external defibrillation equipment available during implant and electrophysiologic testing. Ensure that an external defibrillator and medical personnel skilled in CPR are present during post-implant device testing should the patient require external rescue. Do not use this pulse generator with another pulse generator. Program the pulse generator Tachy Mode(s) to Off during implant, explant, or postmortem procedures to avoid inadvertent high voltage shocks. Do not kink, twist, or braid the lead with other leads as doing so could cause lead insulation abrasion damage or conductor damage. For leads that require the use of a Connector Tool, use caution handling the lead terminal when the Connector Tool is not present on the lead. Do not directly contact the lead terminal with any surgical instruments or electrical connections such as PSA (alligator) clips, ECG connections, forceps, hemostats, and clamps. Do not contact any other portion of the DF4–LLHH or DF4–LLHO lead terminal, other than the terminal pin, even when the lead cap is in place. Do not use atrial tracking modes in patients with chronic refractory atrial tachyarrhythmias. Tracking of atrial arrhythmias could result in ventricular tachyarrhythmias. Advise patients to seek medical guidance before entering environments that could adversely affect the operation of the active implantable medical device, including areas protected by a warning notice that prevents entry by patients who have a pulse generator. RESONATE HF, RESONATE, PERCIVA HF, PERCIVA, VIGILANT and MOMENTUM devices are considered MR Conditional. For these devices, unless all of the MRI Conditions of Use are met, MRI scanning of the patient does not meet MR Conditional requirements for the implanted system, and significant harm to or death of the patient and/or damage to the implanted system may result. Do not expose patients with non-MR conditional devices to MRI scanning. For potential adverse events applicable when the Conditions of Use are met or not met, refer to the MRI Technical Guide. Do not subject a patient with an implanted pulse generator and/or lead to diathermy. If desired, ensure that Patient Triggered Monitor is enabled prior to sending the patient home. Once the Patient Triggered Monitor feature has been triggered by the magnet and an EGM has been stored, or after 60 days have elapsed from the day that Store EGM was enabled, the patient should not apply the magnet.

PRECAUTIONS
For specific information on precautions, refer to the following sections of the product labeling: clinical considerations, sterilization and storage, implantation, device programming, environmental and medical therapy hazards, hospital and medical environments, home and occupational environments, follow up testing, explant and disposal, supplemental precautionary information.

POTENTIAL ADVERSE EVENTS
Based on the literature and on pulse generator and/or lead implant experience, the following alphabetical list includes the possible adverse evets associated with the included devices: Air embolism; Allergic reaction; Bleeding; Bradycardia; Cardiac tamponade; Chronic nerve damage; Component failure; Conductor coil fracture; Death; Elevated thresholds; Erosion; Excessive fibrotic tissue growth; Extracardiac stimulation (muscle/nerve stimulation); Failure to convert an induced arrhythmia; Fluid accumulation; Foreign body rejection phenomena; Formation of hematomas or seromas; Heart block; Heart failure following chronic RV apical pacing; Inability to defibrillate or pace; Inappropriate therapy (e.g., shocks and antitachycardia pacing (ATP) where applicable, pacing; Incisional pain; Incomplete lead connection with pulse generator; Infection including endocarditis; Insulating myocardium during defibrillation with internal or external paddles; Lead dislodgement; Lead fracture; Lead insulation breakage or abrasion; Lead perforation; Lead tip deformation and/or breakage; Local tissue reaction; Loss of capture; Myocardial infarction (MI); Myocardial necrosis; Myocardial trauma (e.g., tissue damage, valve damage); Myopotential sensing; Oversensing/undersensing; Pacemaker-mediated tachycardia (PMT); Pericardial rub, effusion; Pneumothorax; Pulse generator migration; Shunting current during defibrillation with internal or external paddles; Syncope; Tachyarrhythmias, which include acceleration of arrhythmias and early, recurrent atrial fibrillation; Thrombosis/thromboemboli; Valve damage; Vasovagal response; Venous occlusion; Venous trauma (e.g., perforation, dissection, erosion); Worsening heart failure.

For a list of potential adverse events associated with MRI scanning, refer to the MRI Technical Guide. Patients may develop psychological intolerance to a pulse generator system and may experience the following: Dependency; Depression; Fear of premature battery depletion; Fear of a device malfunction.

92436178 Rev B

EMBLEM™ MRI S-ICD System

CAUTION: Federal law (USA) restricts this device to sale by or on the order of a physician. Rx only. Prior to use, please see the complete "Instructions for Use" and MRI Technical Guide for more information on Indications, Contraindications, Warnings, Precautions, Adverse Events, and Operator's Instructions.

INDICATIONS FOR USE The S-ICD System is intended to provide defibrillation therapy for the treatment of life-threatening ventricular tachyarrhythmias in patients who do not have symptomatic bradycardia, incessant ventricular tachycardia, or spontaneous, frequently recurring ventricular tachycardia that is reliably terminated with anti-tachycardia pacing.

CONTRAINDICATIONS Unipolar stimulation and impedance-based features are contraindicated for use with the S-ICD System.

WARNINGS • Concomitant use of the S-ICD System and implanted electro-mechanical devices (for example implantable neuromodulation/neurostimulation systems, ventricular assist device (VAD), or implantable insulin pump or drug pump) can result in interactions that could compromise the function of the S-ICD, the co-implanted device, or both. The S-ICD is intended as lifesaving therapy and should be seen as priority in the decision and evaluation of concomitant system implants over non-lifesaving applications. Electromagnetic (EMI) or therapy delivery from the co-implanted device can interfere with S-ICD sensing and/or rate assessment, resulting in inappropriate therapy or failure to deliver therapy when needed. In addition, a shock from the S-ICD pulse generator could damage the co-implanted device and/or compromise its functionality. Verify sensing configuration, operation modes, surgical considerations and existing placement of all involved devices prior to any co-implant. To help prevent undesirable interactions, test the S-ICD system when used in combination with the co-implanted device, and consider the potential effect of a shock on the co-implanted device. Induction testing is recommended to ensure appropriate detection and time to therapy for the S-ICD and appropriate post-shock operation of the co-implanted device. Failure to ensure appropriate detection and time to therapy delivery of the S-ICD system could result in patient injury or death. • Following completion of the interaction testing, thorough follow-up evaluation of all co-implanted devices should be performed to ensure that device functions have not been compromised. If operational settings of the co-implanted devices change or if patient conditions changes which may affect S-ICD sensing and therapy performance, re-evaluation of the co-implanted devices may be required. • All Boston Scientific S-ICD implantable components are designed for use with the Boston Scientific or Cameron Health S-ICD System only. Connection of any S-ICD System components to a non-compatible component has not been tested and could result in failure to deliver life-saving defibrillation therapy. • Always have external defibrillation equipment and medical personnel skilled in CPR available during implant and follow-up testing. If not terminated in a timely fashion, an induced ventricular tachyarrhythmia can result in the patient's death. • Using multiple pulse generators could cause pulse generator interaction, resulting in patient injury or a lack of therapy delivery. Test each system individually and in combination to help prevent undesirable interactions. Refer to "S-ICD System and Pacemaker Interaction" on page 73 for more information. • Attention is required to placement of the arm ipsilateral to the device implant to avoid injury of the ulnar nerve and brachial plexus while the patient is in the supine position during device implantation and before VF induction or shock delivery. The patient should be positioned with the arm abducted to an angle of no more than 60° with the hand in a supinated (palm up) position during the implant phase of the procedure. Securing the arm to an arm board is standard practice to maintain positioning of the arm during device implantation. Do not strap the arm too tightly during defibrillation testing. Elevation of the torso through use of a wedge may also add stress to the shoulder joint and should be avoided during defibrillation testing. • Use appropriate anchoring techniques as described in the implant procedure to prevent S-ICD System dislodgement and/or migration. Dislodgement and/or migration of the S-ICD System may result in an inappropriate shock or failure to deliver therapy to the patient. • Use caution when placing a magnet over the S-ICD pulse generator because it suspends arrhythmia detection and therapy response. Removing the magnet resumes arrhythmia detection and therapy response. • In patients with a deep implant placement (greater distance between the magnet and the pulse generator), magnet application may fail to elicit the magnet response. In this case the magnet cannot be used to inhibit therapy. • Advise patients to seek medical guidance before entering environments that could adversely affect the operation of the active implantable medical device, including areas protected by a warning notice that prevents entry by patients who have a pulse generator. • High shocking electrode impedance may reduce VT/VF conversion success. • When positioning the electrode and pulse generator, avoid excessive tension on the electrode, particularly if the electrode body extends over the pulse generator. This could cause structural damage, abrasion, and/or conductor discontinuity. • Although pliable, the electrode is not designed to tolerate excessive flexing, tight radius bending, kinking, or twisting. This could cause structural damage, conductor discontinuity, electrode migration, and/or dislodgement. • Electrode fracture, abrasion, under-insertion of the electrode connector into the pulse generator connector port, or a loose setscrew connection may result in compromised sensing, loss of therapy, or inappropriate therapy. • Following any sensing parameter adjustment or any modification of the subcutaneous electrode, always verify appropriate sensing. • Determine if the device and programmed parameters are appropriate for patients with SVTs because SVTs can initiate unwanted device therapy. • During a device software update, tachycardia therapy is suspended. Always monitor the patient and have external defibrillation equipment available during interrogation. • Do not expose a patient with an implanted S-ICD System to diathermy. • EMBLEM S-ICD devices are considered MR Conditional. Unless all MRI Conditions of Use are met, MRI scanning of the patient does not meet MR Conditional requirements for the implanted system. • The Programmer is MR Unsafe and must remain outside the MRI site Zone III (and higher) as defined by the American College of Radiology Guidance Document on MR Safe Practices. • During MRI Protection Mode the Tachycardia therapy is suspended. • MRI scanning after ERI status has been reached may lead to premature battery depletion, a shortened device replacement window, or sudden loss of therapy. • The Beeper may no longer be usable following an MRI scan. • The pulse generator may be more susceptible to low frequency electromagnetic interference at induced signals greater than 80 uV. • Immersion in saltwater and similar conductive fluid environments (i.e. ocean, saltwater pools) may divert some defibrillation shock energy away from the patient's heart into the surrounding conductive fluid (as evidenced by a lower-than-normal shock impedance). This may reduce VT/VF conversion success, especially in patients with low BMI.

PRECAUTIONS For specific information on precautions, refer to the following sections of the product labeling: clinical considerations, sterilization and storage, implantation, device programming, environmental and medical therapy hazards, hospital and medical environments, home and occupational environments, follow up testing, explant and disposal, supplemental precautionary information. • The S-ICD System has not been evaluated for pediatric use. • The S-ICD System does not provide long-term bradycardia pacing, cardiac resynchronization therapy (CRT), or antitachycardia pacing (ATP). • When implanting the S-ICD system in a patient with sternal wires, ensure that there is no contact between the sternal wires and the distal and proximal sense electrodes (for example, by using fluoroscopy). Compromised sensing can occur if metal-to-metal contact occurs between a sense electrode and a sternal wire. If necessary, re-tunnel the electrode to ensure sufficient separation between the sense electrodes and the sternal wires. • Implanting a replacement device in a subcutaneous pocket that previously housed a larger device may result in pocket air entrapment, migration, erosion, or insufficient grounding between the device and tissue. Irrigating the pocket with sterile saline solution decreases the possibility of pocket air entrapment and insufficient grounding. Suturing the device in place reduces the possibility of migration and erosion.

Electromagnetic Interference (EMI) Precautions • Avoid electromagnetic interference (EMI). Advise patients to avoid sources of EMI because EMI may cause the pulse generator to deliver inappropriate therapy or inhibit appropriate therapy. • Moving away from the source of the EMI or turning off the source usually allows the pulse generator to return to normal operation. • Examples of potential EMI sources are: o Electrical power sources o Arc welding or resistance welding equipment (should remain at least 24 inches from the implant) o Robotic jacks o High voltage power distribution lines o Electrical smelting furnaces o Large RF transmitters such as radar o Radio transmitters, including those used to control toys o Electronic surveillance (antitheft) devices o An alternator on a car that is running o Medical treatments and diagnostic tests in which an electrical current is passed through the body, such as TENS, electrocautery, electrolysis/thermolysis, electrodiagnostic testing, electromyography, or nerve conduction studies o Any externally applied device that uses an automatic lead detection alarm system (e.g., an EKG machine) • Home appliances. Home appliances that are in good working order and properly grounded do not usually produce enough EMI to interfere with pulse generator operation. There have been reports of pulse generator disturbances caused by electric hand tools or electric razors used directly over the pulse generator implant site. • Electronic Article Surveillance (EAS) and security systems. Advise patients how to avoid impact to cardiac device function due to antitheft and security gates, tag deactivators, or tag readers that include radio frequency identification (RFID) equipment. These systems may be found at the entrances and exits of stores, at checkout counters, in public libraries, and in point-of-entry access control systems. Patients should avoid lingering near or leaning against antitheft and security gates and tag readers. In addition, patients should avoid leaning against checkout counter-mounted and handheld tag deactivation systems. Antitheft gates, security gates, and entry control systems are unlikely to affect cardiac device function when patients walk through them at a normal pace. If the patient is near an electronic antitheft, security, or entry control system and experiences symptoms, they should promptly move away from nearby equipment and inform their doctor. • Cellular phones. Patients should not carry a cellular phone within 15 cm (6 inches) of the implanted device in order to avoid interaction which may cause the pulse generator to deliver inappropriate therapy or inhibit appropriate therapy. Advise patients to hold cellular phones to the ear opposite the side of the implanted device, and to avoid storing a cellular phone within 15 cm (6 inches) of the implanted device. Examples of storage locations to be avoided include a breast or other shirt pocket, on a belt, or in a handbag held near the implant location. • Static magnetic fields. Advise patients that extended exposure to strong (greater than 10 gauss or 1 mTesla) magnetic fields may suspend arrhythmia detection. Examples of permanent magnet—containing sources to be aware of include: o Industrial motors if held within 60 cm (24 inches) of the pulse generator o MRI scanners o Large stereo speakers if held within 60 cm (24 inches) of the pulse generator o Telephone receivers if held within 1.27 cm (0.5 inches) of the pulse generator o Magnetic wands such as those used for airport security and in the Bingo game o Cellular phones, ear buds, or headphones, if held within 15 cm (6 inches) of the pulse generator o Magnetically attached charging port or cable, such as used in laptops or cellular phones, if held within 15 cm (6 inches) of the pulse generator o Be aware of other body-worn items which may contain magnets, such as wrist bands, jewelry, clothing, nametags, CPAP masks, etc.

POTENTIAL ADVERSE EVENTS Potential adverse events related to implantation of the S-ICD System may include, but are not limited to, the following: • Acceleration/induction of atrial or ventricular arrhythmia • Adverse reaction to induction testing • Allergic/adverse reaction to system or medication • Bleeding • Conductor fracture • Cyst formation • Death • Delayed therapy delivery • Discomfort or prolonged healing of incision • Electrode deformation and/or breakage • Electrode insulation failure • Erosion/extrusion • Failure to deliver therapy • Fever • Hematoma/seroma • Hemothorax • Improper electrode connection to the device • Inability to communicate with the device • Inability to defibrillate or pace • Inappropriate post-shock pacing • Inappropriate shock delivery • Infection • Injury to or pain in upper extremity, including clavicle, shoulder, and arm • Keloid formation • Migration or dislodgement • Muscle/nerve stimulation • Nerve damage • Organ injury or perforation • Pneumothorax • Post-shock/post-pace discomfort • Premature battery depletion • Random component failures • Stroke • Subcutaneous emphysema • Surgical revision or replacement of the system • Syncope • Tissue damage • Tissue redness, irritation, numbness or necrosis • Vessel injury or perforation.

Transient procedural adverse events are expected in some patients. These include, but are not limited to, discomfort, pain and other systemic symptoms that might be related to medications or other interventions performed during implant.

Patients who receive an S-ICD System may develop psychological disorders that include, but are not limited to, the following: • Depression/anxiety • Fear of device malfunction • Fear of shocks • Phantom shocks.

92436235 (Ver. B)

 CRM-1883516-AA