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## Original article

## Profiling cardiac arrhythmia and heart failure patients in India: The Pan-arrhythmia and Heart Failure Observational Study



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## ABSTRACT

**Background:** The PANARrhythMia and Heart Failure Registry (PANARM HF) characterized demographic, clinical and interventional therapy indication profiles of cardiac arrhythmia (CA) and heart failure (HF) patients in India.

**Methods:** Consulting Physicians (CP) who medically manage CA and HF patients enrolled patients with one or more of the following: syncope, pre-syncope, dyspnea, palpitation, fatigue and LV dysfunction. The CPs were trained by interventional cardiologists (IC) to identify CA/HF patients indicated for implantable device/radiofrequency ablation (RFA). 59 CP's, 16 IC's & 2205 patients from 12 cities participated. Demographic, clinical, device/RFA indication and referral-consultation profiles were created. IC's provided device/RFA recommendations based on these profiles.

**Results:** The CA/HF distribution of patients was: HF – 58%, bradyarrhythmia – 15%, atrial fibrillation – 15%, other supraventricular tachyarrhythmia – 10% and ventricular tachycardia/fibrillation – 4.5%. 62% of the CA/HF population was male and 45% were below age 60. Coronary artery disease (52%), hypertension (44%), diabetes (30%) & myocardial infarction (20%) were prominent. 1011 (46%) of the CA/HF population were potential device/RFA candidates according to the IC's. However, only 700 (69%) of these patients were referred to the IC by the CP. Of referred patients, only 177 (25%) consulted the IC and were recommended therapy. Thus, 824 (83%) of patients indicated for interventional therapy were not advised therapy or did not opt for it.

**Conclusion:** The India PANARM HF study provides new information and insights into the demographic, clinical, interventional therapy, referral and consultation pattern profiles of CA/HF patients in India.

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## 1. Introduction

Cardiovascular diseases like heart failure (HF) and cardiac arrhythmias (CA) form a major component of the non-communicable disease burden in the Indian population.<sup>1–7</sup> Approximately 40,000–50,000 CA/HF patients receive interventional device therapies like pacemakers, implantable cardioverter defibrillators (ICD), cardiac resynchronization therapy (CRT) and/or radio-frequency ablation (RFA) annually in India.<sup>8–10</sup> However, there is very limited published information that systematically profiles Indian HF and CA patients. There is virtually no insight into the diagnostic and interventional treatment access process for these patients.

We implemented a clinical registry that enrolled 2205 CA/HF patients presenting to 59 non-interventional consulting physicians (CP) across 12 cities in India and used a diagnosis protocol (DP) to characterize their demographic, cardiovascular, interventional device/RFA therapy indication profiles and referral/consultation patterns. The results from such a registry could provide a basis for healthcare practitioners, policy makers, payers and medical administrations for improving the overall management and access to treatment for patients suffering from CA and HF. Also, the information gained from the registry could be used to increase physician awareness, diagnosis & therapy prescription and outline improved processes for HF and CA management.

## 2. Methods

The PANARM HF registry, a prospective, multi-center, non-interventional, observational study was conducted during November, 2008 to March 2010 in compliance with currently accepted ethical considerations and according to the principles outlined in the 'World Medical Association Declaration of Helsinki' (October 2000). All patients provided written consent for the release of their anonymized data by signing the study Patient Data Release Form. The study was registered in the Clinical Trial Registry of India (CTRI) database with number as CTRI/2008/091/000204.

Two categories of physicians from across 12 cities in India participated in the registry: 1) 59 non-interventional CP who were MD's or non-interventional cardiologists by qualification, and 2) 16 interventional cardiologists (IC) who were expert practitioners of implantable device therapy, and in several cases, who also perform RFA.

A detailed diagnosis protocol (DP) comprising history and symptom assessment, physical exam, ECG, echocardiographic testing (where applicable) and consensus-guidelines based interventional therapy indication assessment was defined by a group of IC's to classify patients suffering from CA and/or HF and interventional therapy options for these patients. Cardiac arrhythmia and heart failure patients analyzed in the registry were classified as defined in Table 1. The ACC/AHA/HRS ACC/AHA/HRS 2008 Guidelines for Device-Based Therapy of Cardiac Rhythm Abnormalities<sup>8</sup> were used to identify patients indicated for pacemaker, ICD and CRT. The ACC/AHA Guidelines for Clinical Intracardiac Electrophysiological and Catheter Ablation Procedures<sup>9</sup> were used to identify patients indicated for RFA. All participating CP's were trained on implementing the DP by IC's during study training meetings that preceded CP enrollment into the study. In addition, a variety of educational tools were provided to the CP to supplement the DP and aid in the diagnosis & therapy assessment process. Bimonthly study review meetings between ICs and their assigned CPs were encouraged. Fig. 1 shows a flow chart of the study process.

CP's evaluated all patients presenting to them and identified patients eligible for enrolment according to the following inclusion criteria: 1) patients with one or more of the following symptoms secondary to CA and/or HF – syncope, pre-syncope, dyspnea, palpitations, fatigue, and/or 2) left ventricular dysfunction (left ventricular ejection fraction (LVEF)  $\leq 40\%$  measured through echocardiogram), 3) patients who had signed and dated a Patient Data Release Form specified in this study plan, and 4) patients who were at least 18 years of age at the time of enrolment. The following patients were excluded: 1) patients with HF arising out of primary valvular diseases 2) patients with acute myocardial infarction

**Table 1**  
Heart failure and cardiac arrhythmias diagnosis definitions.

Patient Cohort	Definition	Assessor
Heart Failure	<ul style="list-style-type: none"> <li>HF stage B/C/D, LVEF <math>\leq 40\%</math> NYHA Class II/III/IV</li> <li>LVEF <math>&gt;40\%</math>, HF Stage C/D, NYHA Class III/IV</li> </ul>	IC
SCA Primary Prevention – Ischemic	<ul style="list-style-type: none"> <li>LVEF <math>\leq 30\%</math> based on echocardiographic testing</li> <li>Old MI (<math>&gt;6</math> weeks) based on history/ecg/echo</li> <li>NYHA I or II or III based on history/symptoms</li> </ul>	CP
SCA Primary Prevention – Non-ischemic	<ul style="list-style-type: none"> <li>NYHA II or III based on history/symptoms</li> <li>LVEF <math>\leq 30\%</math> based on echocardiographic testing</li> <li>No Coronary artery disease based on history</li> <li>No MI based on history</li> </ul>	CP
Bradycardia	<ul style="list-style-type: none"> <li>Sinus Node Dysfunction – ECG based</li> <li>3° Atrial Ventricular (AV) block – ECG based</li> <li>2° AV block Type 2 – ECG based</li> <li>2° AV block Type 1 – ECG based</li> <li>1° AV block – ECG based</li> <li>Chronic Atrial Flutter with ventricular bradycardia – ECG based</li> <li>Carotid Sinus Syndrome – ECG &amp; screening</li> </ul>	IC
Atrial Fibrillation	<ul style="list-style-type: none"> <li>Atrial fibrillation – ECG based</li> </ul>	IC
SVT	<ul style="list-style-type: none"> <li>Atrial flutter – ECG based</li> <li>Atrial tachycardia – ECG based</li> <li>Paroxysmal SVT – ECG based</li> </ul>	IC
(MI)	<ul style="list-style-type: none"> <li>Old MI (<math>&gt;6</math> weeks) based on history/ECG</li> </ul>	CP

HF = Heart Failure; LVEF = Left Ventricular Ejection Fraction; SCA = Sudden Cardiac Arrest; MI = Myocardial Infarction; SVT = Supraventricular Tachycardia.

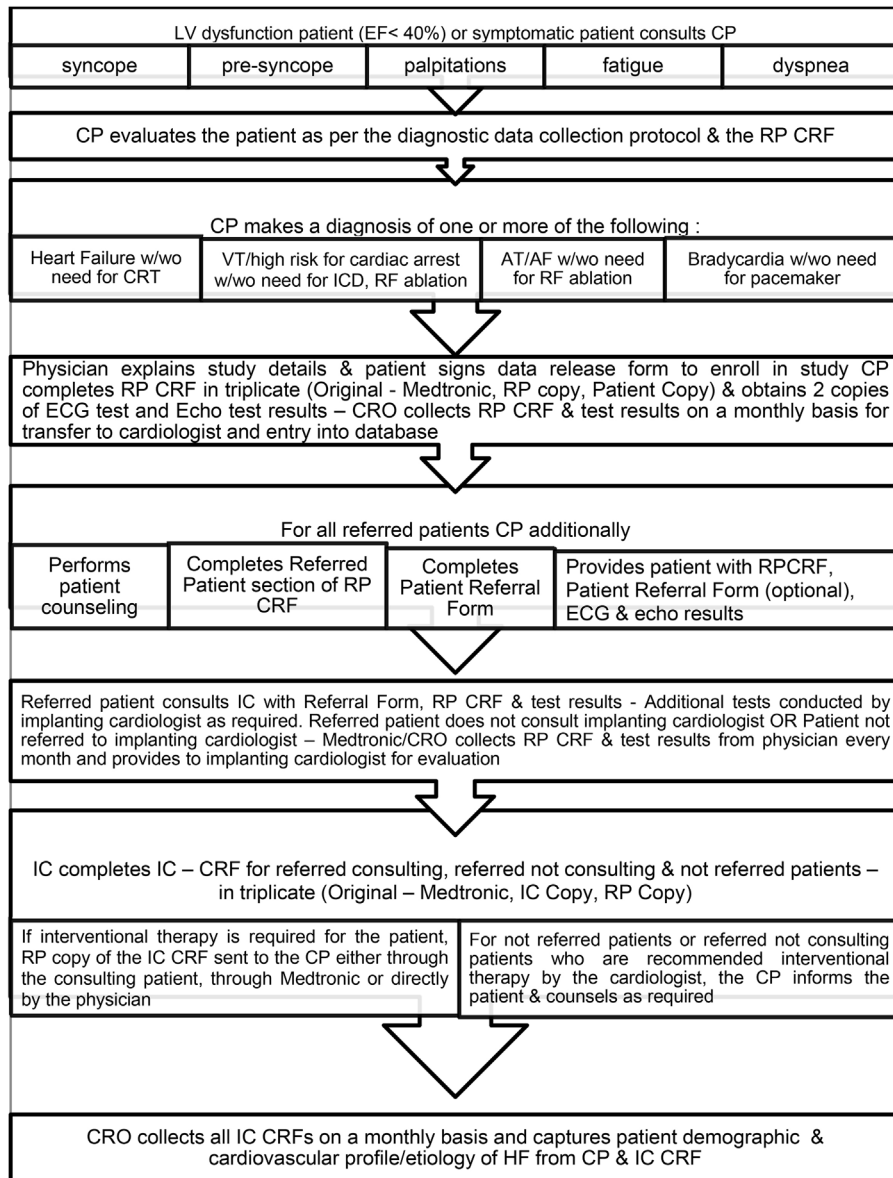


Fig. 1. Schematic of PANARM HF Registry Process.

(<40 days), 3) patients with electrolyte imbalance, acute pulmonary embolism, pneumothorax and other acute syndromes/events that are reversible, and 4) patients with recent percutaneous coronary intervention or cardiovascular surgery (<40 days in the past).

A CP case report form (CP CRF) that captured the patient's demographic, symptom, cardiovascular, disease etiology and therapy indication profile, including ECG for all patients and echocardiographic report for patients with LV dysfunction were completed for all enrolled patients by the CP. All patients who required further evaluation by IC for implantable device therapy/RF ablation in the CP's judgment were counselled and referred to the CP's designated IC participating in the registry for further evaluation and treatment. Patients who did not require interventional therapy in the CP's judgment were not referred to the IC and were prescribed drug management by the CP.

CP CRF, ECG and echo reports for all patients, both referred and not referred by the CP, were transferred to designated IC from the CP on a monthly basis. IC's recorded the final diagnosis, disease etiology and therapy prescription in an IC CRF for each patient. All

information recorded in the CP CRF and IC CRF was analyzed to construct detailed demographic, clinical and device/RFA therapy indication profiles for CA/HF patients presenting to the CP. Continuous data are reported as mean and standard deviation. Categorical data are reported as frequencies (N) and percentages (%). This was a non-comparative study and therefore no statistical testing was performed.

### 3. Results

2205 patients who met study inclusion/exclusion criteria were enrolled in the study. An average of 37 patients was enrolled per CP by the 59 CP contributing to the study population.

#### 3.1. Demographic and clinical profile

Table 2 shows the clinical and demographic profiles of the total registry population and Table 3 that of the HF sub-population. Fatigue, dyspnea and palpitations were the most common symptoms, 76% patients having multiple symptoms and 30% of

**Table 2**  
Demographic and Clinical Profile of CA and HF Patients – N(%).

Total patients	2205
Gender (male)	1376 (62%)
Age (Mean ± STD)	62 ± 13
Age >60 years	1212 (55%)
HF or CA- related symptoms	2154 (98%)
Fatigue	1258 (57%)
Dyspnea	1199 (54%)
Palpitations	1631 (74%)
Pre-syncope	327 (15%)
Syncope	303 (14%)
LVEF ≤ 40%	1321 (60%)
NYHA Class I	43 (3%)
NYHA Class II	466 (35%)
NYHA Class III	597 (45%)
NYHA Class IV	161 (12%)
Cardiac arrhythmias	
Atrial Fibrillation (AF)	341 (15%)
Supraventricular Tachyarrhythmia (not AF)	210 (10%)
Bradyarrhythmia	331 (15%)
Sinus node dysfunction	146 (44%)
III degree AV block	83 (25%)
II degree AV block	37 (11%)
Other bradyarrhythmia	82 (25%)
Ventricular Tachycardia	85 (4%)
Co-morbidities	
Coronary Artery Disease	1146 (52%)
Hypertension	962 (44%)
Diabetes	664 (30%)
Prior Myocardial Infarction	448 (20%)
Primary Prevention SCA High Risk	401 (18%)
Ischemic	226 (56%)
Non-ischemic	186 (46%)

STD = Standard Deviation; HF = Heart Failure; CA = Cardiac Arrhythmia; LVEF = Left Ventricular Ejection Fraction; SCA = Sudden Cardiac Arrest; MI = Myocardial Infarction; AF = Atrial Fibrillation; AV block = Atrioventricular block. Percentages are calculated on the basis of patients with collected information.

**Table 3**  
Heart Failure Patient Cohort Characteristics – N (%).

Heart Failure	1272 (58%)
Demographics	
Age, Mean ± STD	63 ± 12
Gender (Male)	850 (67%)
HF Status	
NYHA Class II	466 (37%)
NYHA Class III	633 (50%)
NYHA Class IV	173 (14%)
Stage B	230 (18%)
Stage C	831 (65%)
Stage D	211 (17%)
LVEF	
<20%	110 (9%)
20%–40%	1114 (88%)
QRS Width	
<120 ms	782 (61%)
120 ms – 149 ms	336 (26%)
≥150 ms	150 (12%)
Etiology	
Ischemic	841 (66%)
Idiopathic	185 (18%)
Unknown	98 (8%)

Percentages are calculated on the basis of patients with collected information.

patients had experienced syncope/pre-syncope. 51 (2%) patients did not have symptoms at the time of enrollment and were included in the study because they had LV dysfunction.

With 1272 (58%) registry patients suffering from HF, it was the most prevalent syndrome followed by bradyarrhythmia 15%, atrial fibrillation – 15%, other supraventricular tachyarrhythmia – 10% and ventricular tachycardia/fibrillation – 4.5%. Approximately 401 (31%) patients of the HF population were also at high risk for Sudden Cardiac Arrest (SCA). The majority of the HF population was in an advanced state of HF, with about 1042 (82%) patients being in Stage C and D, 814 (64%) with LVEF ≤ 30% and 486 (38%) patients with a QRS width ≥ 120 ms.

The bradyarrhythmia population totalled 266 (12%) patients (mean age 63.5 ± 13.5), with 146 (55%) Sinus Node Dysfunction (SND) patients and 120 (45%) 2nd and 3rd degree AV block patients. The SND patients were significantly symptomatic with 79% presenting with syncope/pre-syncope, 62% with fatigue and 48% with dyspnea greater than New York Heart Association (NYHA) Class II. 19% of SND patients had LV dysfunction with EF ≤ 40%. Higher incidence of SND was observed from the 6th decade onwards and AV block a decade earlier. In addition to syncope, fatigue was a significant symptom in both SND and AV block.

20% of the registry population had suffered a prior MI and about 52% were known to have CAD. Hypertension was prevalent in 44% and diabetes in 30% of the patients. At least 50% of the patients in the study had left ventricular dysfunction with an ejection fraction LVEF ≤ 35%. Approximately 37% of the patients had advanced heart failure (NYHA III/IV) at the time of enrollment and 30% were NYHA Class II.

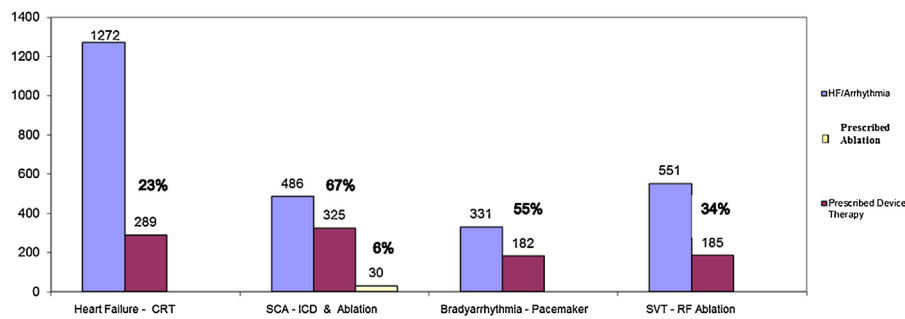
### 3.2. Therapy recommendation and patient referral patterns

As shown in Fig. 2, 1011 out of 2205 (~46%) patients were identified to potentially benefit from pacemaker, ICD, CRT or RFA by the IC. Nearly 50% of the registry patients were identified for medical management only and about 5% needed further evaluation. 11 patients were identified for procedures like revascularization, valve repair/replacement etc. that were outside the scope of this study. In particular, 289/1272 (23%) of the HF patients and 722/1379 (52.4%) of CA patients were classified by IC's as potentially needing interventional device or RFA therapy.

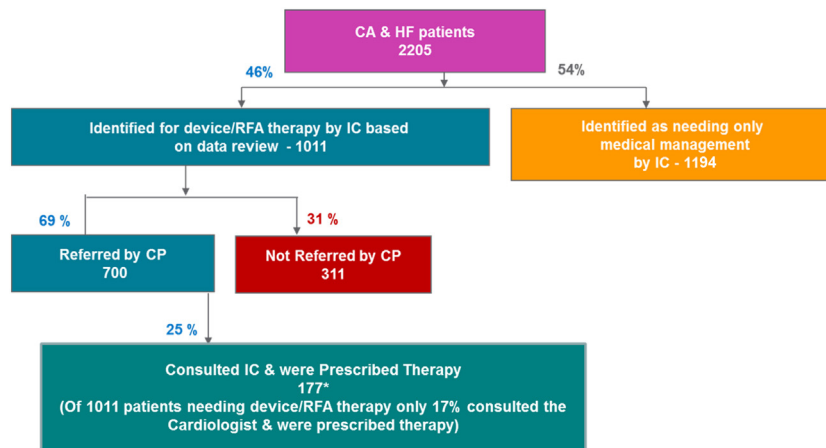
Analysis of the CP referral patterns for the 1011 patients identified by the IC as potentially benefitting from interventional showed that only 700 (69%) of these patients were referred to the IC by their CP and 311 (31%) were not. Analysis of the IC consultation patterns for the 700 referred patients showed that only 177 (~25% of referred patients) consulted the IC – the remaining 523 patients identified by the CP and another 311 not identified by the CP, who could have potentially benefitted from interventional therapy did not consult the IC to whom they were referred within the duration of the study. Thus, only the 177 patients who consulted the IC were actually prescribed therapy, while for the remaining 834 patients who could have benefitted from interventional therapy, the opportunity to receive this therapy was unavailable. This referral, consultation and prescription pattern is depicted in Fig. 3.

## 4. Discussion

To our knowledge, the PANARM HF registry represents the first study that characterizes the demographic, cardiovascular, interventional device or RFA therapy indication profiles and referral/specialist consultation patterns of over 2000 patients with HF and/or CA symptoms presenting to non-interventional consulting physicians across India.



**Fig. 2.** Number of patients with HF or specific CA and number of patients recommended for interventional therapy by IC. 289 (23%) of HF patients were indicated to implant of a CRT device, 325 (67%) patients at risk of SCA were indicated for ICD implant, 182 (55%) patients with bradycardia were indicated to pacemaker implant, 185 (34%) patients with AF/SVT were indicated to RFA ablation.



**Fig. 3.** Referral and intervention therapy recommendation patterns.

#### 4.1. Demographic and clinical profile of arrhythmia and heart failure patients

The majority of the patients (62%) were male. A similar gender ratio was shown in the 11th World pacing survey<sup>11</sup> in patients receiving pacemaker implants in India. The imbalance between male and female recipients of implantable devices or interventional therapies is much lower in the developed world.<sup>11</sup> In India this imbalance could be due to a combination of factors such as reduced cardiovascular disease prevalence amongst females, reluctance to seek healthcare and, more likely, a lower priority and willingness to finance female health in Indian society.

Close to half the population was  $\leq 60$  years, which is lower compared to similar cohorts in other parts of the world.<sup>11–13</sup> Data from the Framingham Heart Study indicate that the mean age at the diagnosis of HF was 70 years.<sup>12</sup> In the western population the average age of patients receiving pacemakers for SND is about 75 years.<sup>13</sup> This is an important finding of our study which indicates an early disease onset, which aligns well with premature onset of cardio-vascular risk factors and lower average life-span of 67 years for males and 69 years for females in India.<sup>14</sup>

Prevalence of heart failure (58%) and cardiac arrhythmias (22% at high risk for SCA, 15% suffering from atrial fibrillation, 15% from bradyarrhythmia) in our study of course derive from the study design and selection criteria. It is noteworthy that a significant percentage (>50%) of patients with HF or CA symptoms were actually found in a fairly advanced stage of cardiovascular disease, as shown by the fact that 82% of HF patients were in stage C or D HF and 722/1379 (52.4%) CA patients were candidates for

interventional therapies. This finding is a clear reflection on the lack of health awareness amongst the Indian population, low priority to pro-actively seek out healthcare and limited availability and access to tertiary care centers.

Given the high proportion of patients with LV dysfunction in the registry, a significant cohort of 401 registry patients (18%) had a clinical profile that placed them in the primary prevention risk category for SCA. 46% of these patients had non-ischemic cardiomyopathy which is higher in comparison to registries that studied patients indicated for ICD therapy for SCA primary prevention from other parts of the world.<sup>13</sup> The non-ischemic group was younger (34.5%  $\leq 51$  years), had a higher ratio of females, lower hypertension and diabetes but a higher percentage of patients with a broad QRS. These patients could represent a high focus group for therapy access due to the potentially higher benefit they may gain from cardiac resynchronization therapy as compared to the more co-morbid and advanced-in stage ischemic cardiomyopathy patients.

Of the 2205 patients enrolled in the study, 331 (15%) patients suffered from bradyarrhythmias, with a higher percentage of SND patients (44%) compared to heart block patients (36%). The 11th World pacing survey<sup>11</sup> showed only 23% of patients receiving pacemakers in India for SND versus 58% for advance heart blocks. Thus, it appears that despite being symptomatic, a significant proportion of SND patients do not receive pacemakers in India, likely due to the relatively benign nature of the disease and limited severity of their symptoms. The age distribution of the SND population indicated that 70% of the patients were below the age of 70, whereas in the western population the average age of patients receiving pacemakers for SND was 75.<sup>13</sup>

Atrial fibrillation or other supraventricular tachyarrhythmias were documented in 551 (25%) patients. The actual prevalence of atrial tachyarrhythmias in the evaluated patients is probably higher due to undocumented intermittent and asymptomatic forms of tachyarrhythmias. 70% of the AF patients were below the age of 70, indicating an earlier onset of disease compared to in the west.<sup>13</sup> The percentage of women was relatively higher in this cohort, at 48% versus an overall female study representation of 38%.

#### 4.2. Interventional therapy indication

Out of 2205 patients, selected only on the basis of HF and/or CA symptoms, 1011 (45.8%) could benefit from interventional device therapy/ablation. As shown in Fig. 2, the percentage of patients indicated for interventional therapy varied according to their disease condition, ranging from 23% for HF patients, 34% of AF/SVT patients, 55% for bradycardia patients and 73% for patients with primary and secondary SCA risk. Cardiac implantable pacemakers and ICD are well established interventional therapies to treat CA patients.<sup>8</sup> Similarly, CRT devices are indicated in patients with LV systolic dysfunction, moderate to severe heart failure symptoms and wide QRS  $\geq 120$  ms, despite optimal medical therapy.<sup>8</sup> Finally RFA is in many cases the first-choice therapy to treat cardiac arrhythmias which result from reentry circuits, as in Wolff–Parkinson–White syndrome, atrioventricular nodal reentrant tachycardia, atrioventricular reentrant tachycardia due to accessory pathways, and atrial flutter. RFA has recently been proposed also as effective treatment of drug refractory AF.<sup>9</sup> The cost of these devices and therapies is a limiting factor in the Indian healthcare system and these therapies are beyond the reach of many patients. However, those who can afford them should be referred to centres and cardiologists experienced in performing these interventional therapies.

#### 4.3. Referral patterns and therapy adoption

Large volumes of advanced cardiovascular diseases are managed by CP in India. Before the study started, CP were characterized by large differences in the knowledge and application of diagnosis, ECG analysis and interventional therapy guidelines for CA/HF patients. The study training programs, diagnostic protocol and tools were deemed of significant value by the CP in enhancing their knowledge and systematizing their approach to patient screening, diagnosis, counselling and referral.

Despite this training, 311/1011 (31%) patients who could benefit from interventional therapy were not referred to IC, as shown in Fig. 3. Similarly 50% of patients who did not need interventional therapy were unnecessarily referred to the IC. Of 1011 patients who could have benefited from interventional therapy, only 177 consulted IC's (17%) due to both inadequate referral (only 69% of patients requiring interventional were referred by CP to IC) as well as poor IC consultation compliance by referred patient (Fig. 3). Since correct identification of indicated patients and patient counselling were issues at the CP level, our data suggest the need for continuous education strategies and simple diagnostic algorithms for improved screening and diagnosis at physician level and for enhanced patient counselling.

In particular our study indicates that CP in India manage significant volumes of primary prevention for SCA patients, many of them with relatively early disease onset and non-ischemic etiology. Unfortunately only a minority of ICD indicated patients were referred and actually received an ICD. ICD therapy for patients meeting primary prevention consensus guidelines is significantly under-utilized all over the world.<sup>15–17</sup>

The key study results are 1) a significant portion of the study population, selected for having HF and CA symptoms, was found in a fairly advanced stage of cardiovascular disease at the time they consulted the physician, 2) almost half the patients with HF and/or CA symptoms would warrant an interventional device therapy or ablation but 3) even in the study controlled environment only 17% of indicated patients consulted an interventional specialist and were prescribed with an interventional therapy.

The study provides substantial new information about health care gaps in India and meaningful insights that can be applied to enhance diagnosis, therapy access and management of these patients. Our results may be valuable for healthcare providers, policy makers, payers and medical administrations to define and implement strategies focused on reducing the disease burden of HF and CA. Our data suggest to focus on enhancing identification, counselling and referral of CA/HF patients indicated for interventional therapy by consulting physicians to specialists who can provide these therapies. In addition, initiatives toward patients education are warranted. The fact that the majority of patients consult physicians only after disease has progressed to advanced stage, as shown in our data, suggest the need for improving patient awareness about cardiovascular diseases and enhancing patients' attitude toward proactive healthcare seeking behaviour through frequent consultation with specialists and acceptance of therapy upon prescription. Finally, it is important for the government, care providers, reimbursement groups, medical insurance and industry to establish innovative programs to address affordability and liquidity barriers that prevent patients prescribed interventional therapies from adopting them.

#### 4.4. Limitations

This was a prospective observational research. The limitations of multicentre observational studies, such as potential bias in patient selection and patient referral and the lack of a control group, apply to our research. The fact that the study was preceded by training on diagnosis and therapy guidelines and that research endpoints were pre-specified possibly mitigated patient selection and referral biases. In addition, the results of the study are limited to the evaluated population of subjects with HF and/or CA symptoms.

### 5. Conclusions

Through an observational study we found that a significant portion of patients with HF or CA symptoms, presenting to non-interventional consulting physicians across 12 cities in India, was in a fairly advanced stage of cardiovascular disease. In fact almost half the patients were indicated for interventional device therapy or ablation. We found that, even in the study controlled environment, only a minority (17%) are prescribed the indicated interventional therapy. In particular, while therapy penetration was fair for pacemaker and RF ablation therapy, it was minimal for CRT and ICD. Healthcare quality improvement strategies are warranted to reduce the HF and CA disease burden.

#### Funding sources

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## Appendix A. List of participating Investigators, Institutions

Serial No.	Investigator Name	Role in the study	Study Center	City	State	Zone
1	Dr. Ajay Naik	Implanting Cardiologist	Heart Care Clinic, 201, 2 <sup>nd</sup> Floor Balleshwar Avenue, Opposite Rajpath Club S G Highway, Ahmedabad-380054	Ahmedabad	Gujarat	West
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3	Dr. Dhiren Joshi	Consulting Physician	Shashi Shopping Centre, Near Anjali Cinema, Jawarnagar, Ahmedabad-380 007	Ahmedabad	Gujarat	West
4	Dr. Gaurav Chhaya	Consulting Physician	Shiva Medi Care Clinic, UK-2, Vrajbhoomi Complex, Opposite Riddhi Tower, Jodhpur Gam, Near Rosewood Tower, Ahmedabad - 380015.	Ahmedabad	Gujarat	West
5	Dr. Jayesh Shah	Consulting Physician	Sharada Medical Nursing, Plot No. 904/1, Opposite, Gh - Road, Sector - 7 -C, Gandhinagar -382007	Ahmedabad	Gujarat	West
6	Dr. Kirti Akhani	Consulting Physician	Trupti Heart & Medical Hospital, 3 <sup>rd</sup> Floor, Snaked Complex, Opposite Petrol Pump, Mangle Park, Geetamandir Road, Ahmedabad - 380022.	Ahmedabad	Gujarat	West
7	Dr Raghu Satyanarayan	Consulting Physician	5 <sup>th</sup> Floor , Ankur Complex, Ankur , Naranpura, Ahmedabad	Ahmedabad	Gujarat	West
8	Dr. Aparna Jaswal	Implanting Cardiologist	Escorts Heart Institute and Research Centre, Okhla road ,New Delhi-110025	New Delhi	New Delhi	North
9	Dr. A.K. Manchanda	Consulting Physician	D-47, Bali Nagar, New Delhi-110015	New Delhi	New Delhi	North
10	Dr. A.K. Kaushik	Consulting Physician	A block, Janakpuri, New Delhi-110 058	New Delhi	New Delhi	North
11	Dr. I.J. KALRA	Consulting Physician	DA-3A, LIG Flats, Behind DA-block, Hari Nagar, New Delhi 110018	New Delhi	New Delhi	North
12	Dr. Rajesh Gupta	Consulting Physician	7, Local Shopping Centre, Derawal Nagar, Gujranwala Town Phase IV, Delhi-110009	New Delhi	New Delhi	North
13	Dr. Gagan Kaushal	Consulting Physician	Life Care Hospital, Near Community Center Main Market Sector-7, Urban Estate, Karnal, Haryana -132001	Karnal	Haryana	North
14	Dr. Jitendra Singh Makkar	Implanting Cardiologist	Fortis Escorts Hospital, Malviya Nagar, Jaipur - 302017	Jaipur	Rajasthan	North
15	Dr. Sanjeev Gupta	Consulting Physician	7 KHA-11, Jawahar Nagar, Jaipur	Jaipur	Rajasthan	North
16	Dr. Subhash Saxena	Consulting Physician	37, Vinoba Vihar, Malviya Nagar, Jaipur-17	Jaipur	Rajasthan	North
17	Dr. Puneet Rihwani	Consulting Physician	14/201, Malviya Nagar, Jaipur-17	Jaipur	Rajasthan	North
18	Dr. Jagmohan Varma	Implanting Cardiologist	2283 Sec-21-C Chandigarh - 160017	Chandigarh	Chandigarh	North
19	Dr. Anjali Dattal	Consulting Physician	Datal Multispecialty Hospital Thakurdwara Chowk, Distt. Kangra H.P.- 176102	Kangra	Himachal Pradesh	North
20	Dr. Manoj Agarwal	Consulting Physician	Aggarwal Heart & Surgical Hospital, Ambala City	Ambala	Punjab	North
21	Dr. Chandu Bowry	Consulting Physician	72-73 Udhan Singh Nagar Jalandhar	Jalandhar	Punjab	North
22	Dr. Pramod Sinha	Consulting Physician	Harihar Hospital, Gutkar, Mandi, (H.P)	Mandi	Himachal Pradesh	North
23	Dr. Gursharan Singh Sidhu	Consulting Physician	Sidhu Hospital, Doraha, Punjab	Ludhiana	Punjab	North
24	Dr. V.P. Mahajan	Consulting Physician	Mahajan Clinic, Shyam Nagar Dharamsala, H.P.-176215	Dharamsala	Himachal Pradesh	North
25	Dr. Arun Chopra	Implanting Cardiologist	Escorts Hospital, Amritsar	Amritsar	Punjab	North
26	Dr. Ashok Mahajan	Consulting Physician	Mahajan Nursing Home, Katra Khajana, Amritsar	Amritsar	Punjab	North
27	Dr. Satinder Arora	Consulting Physician	Hartej Nursing Home, Court Road, Amritsar	Amritsar	Punjab	North
28	Dr. Ved Gupta	Consulting Physician	Ved Gupta Hospital, Mall Road, Amritsar	Amritsar	Punjab	North
29	Dr. B.S Bal	Consulting Physician	Guru Nanak Hospital Majitha Road Amritsar	Amritsar	Punjab	North
30	Dr. Balbir Singh	Implanting Cardiologist	Medanta Hospital, Gurgaon, Haryana	Gurgaon	Haryana	North
31	Dr. Tushar Roy	Consulting Physician	E327, Greater Kailash Part-1, New Delhi-110048	New Delhi	New Delhi	North
32	Dr. Hem Lata Tewari	Consulting Physician	C-5 Green park extn, New Delhi-110016	New Delhi	New Delhi	North
33	Dr. Rajesh Madan	Consulting Physician	Ayushman Hospital Sec 12 , Dwarka, New Delhi-110075	New Delhi	New Delhi	North
34	Dr. Yash Lokhandwala	Implanting Cardiologist	CONSULTING: 1, Parag Niketan, 1st Cross Road, off N.S Road, 10-JVPD Scheme, Mumbai 400056	Mumbai	Maharashtra	West
35	Dr. Ramesh Dargad	Consulting Physician	201, Sterling Apts, Church Rd, Marol, Andhrei East Mumbai-400059	Mumbai	Maharashtra	West

36	Dr. Ulhas Shirodkar	Consulting Physician	1/A, Labh Ashish, Gr Fl, Opp Goklibai High School, Dadabhai Rd, Irla, Vile Parle, Mumbai-400056	Mumbai	Maharashtra	West
37	Dr. Nitin Rathod	Consulting Physician	Flat No 2, Harshabad Society, Babubhai Rd, Vile-Parle West, Mumbai-400056	Mumbai	Maharashtra	West
38	Dr. Deepak Namjoshi	Consulting Physician	Criticare Hospital, Plot. No. 38/39, Main Gulmohor Road, J.V.P.D Scheme, Andheri (w), Mumbai – 400049.	Mumbai	Maharashtra	West
39	Dr. P.K. Maheshwari	Consulting Physician	Vital Care Center, A/1 Bldg No 20,Manish Nagar, Four Bungalows, Andheri West Mumbai-400053,	Mumbai	Maharashtra	West
40	Dr. Amit Vora	Implanting Cardiologist	Glenmark Cardiac Centre, Flat No 10, Nandadeep,209-D, Dr Ambedkar Road, Matunga (E), Mumbai 400 019	Mumbai	Maharashtra	West
41	Dr. S. H. Doshi	Consulting Physician	Bhargav Medical Center,CTS-137, Ram Mandir Road, Babhai, Borivili West,Mumbai - 400091	Mumbai	Maharashtra	West
42	Dr. Pankaj Gandhi	Consulting Physician	Amar Nursing Home, Nr Kandivli Tel Ex, Kandivli (W), Mumbai -67	Mumbai	Maharashtra	West
43	Dr. Parag Ajmera	Consulting Physician	Arihant Hear Clinic,103, lancelot Apt, SV Road, Borivili West Mumbai	Mumbai	Maharashtra	West
44	Dr. Ketan Mehta	Consulting Physician	2, Dattani Chambers, S V Road, Malad (W),Mumbai 400 064	Mumbai	Maharashtra	West
45	Dr. Ulhas M Pandurangi,	Implanting Cardiologist	Sr. Consultant Cardiologist & Electrophysiologist. Madras Medical Mission, No.4a-Dr. JJ Nagar, Mogappair. Chennai -32.	Chennai	Tamil Nadu	South
46	Col . Dr. T.S. Ramakrishnan	Consulting Physician	17/1, North Crescent Rd, T.Nagar. Chennai -600017	Chennai	Tamil Nadu	South
47	Dr. Vamsie Mohan . MD	Consulting Physician	Ambal's Hospital, 113,Lioyds Rd, Chennai -600014	Chennai	Tamil Nadu	South
48	Dr. Anil Mishra	Implanting Cardiologist	B.M.Birla Heart Research Centre, 1/1, National Library Avenue, Kolkata-700027.	Kolkata	West Bengal	East
49	Dr. Apurva Parekh	Consulting Physician	7/1, Heysham Road, Sukhshanti Kunj, Flat No. – 2B ,Front Block,Kolkata - 700020	Kolkata	West Bengal	East
50	Dr. R. S Ghose	Consulting Physician	1 , Sarat Chatterjee Avenue , Kolkata - 700029	Kolkata	West Bengal	East
51	Dr. Dhiman Kahali	Implanting Cardiologist	B.M. Birla Heart Research Centre, 1/1, National Library Avenue, Kolkata-700027.	Kolkata	West Bengal	East
52	Dr. Saurabh Mukhopadhyay	Consulting Physician	8/D , S P Mukherjee Road, Bhowanipore , Kolkata - 700025	Kolkata	West Bengal	East
53	Dr. Debasis Ghosh	Implanting Cardiologist	Apollo Gleneagles Hospitals 58, Canal Circular Road, Kolkata - 700054	Kolkata	West Bengal	East
54	Dr. Lalit Kumar Muskara	Consulting Physician	Apollo Clinic, 1st Floor, Block DC, Sector-1, Salt Lake, Kolkata-700064	Kolkata	West Bengal	East
55	Dr. R.R. Mantri	Implanting Cardiologist	Sir Ganga Ram Hospital, Pvt. OPD: Room No.F-33,1st floor, New Delhi-110060	New Delhi	New Delhi	North
56	Dr. D.K. Chauhan	Consulting Physician	4718/21A, Dayanand Road, Ansari Road Daryaganj, New Delhi-110002	New Delhi	New Delhi	North
57	Dr. Dharmesh Jain	Consulting Physician	C-2C/239 Janakpuri Near Dabri Crossing, New Delhi	New Delhi	New Delhi	North
58	Dr. Ajit Singh Ghai	Consulting Physician	Ghai Medical Centre WZ-310, Shiv Nagar, Near Mother Dairy, Jail Road, New Delhi-58	New Delhi	New Delhi	North
59	Dr. Rajesh Gogia	Consulting Physician	3/200, Subhash Nagar New Delhi-110027,Res.:EL-5,1st floor Anand Vihar, Hari Nagar, New Delhi-64	New Delhi	New Delhi	North
60	Dr. Anoop Gupta	Implanting Cardiologist	Krishna Hospital, Gumma, Bopal, Ahmedabad	Ahmedabad	Gujarat	West
61	Dr. Darshan Pandya	Consulting Physician	Sanjivani Heart & Medical Hospital,166, Shopping Centre, Near Nigam Petrol Pump, Sector 21, Gandhinagar	Ahmedabad	Gujarat	West
62	Dr. Mukul K Oza	Consulting Physician	Clinic: 5 Anand Shopping Centre, Bhatta Bus Stand, Vasna Road, Ahmedbad - 380 007.	Gandhinagar	Gujarat	West
63	Dr. Sudhendu R Patel	Consulting Physician	Partha Medical Center,U-12 Nayandeep Complex,Opp.Luv Kush Tower, Nr. Udgam School, Drive-in –Road,Thaltej, Ahmedabad-380054	Ahmedabad	Gujarat	West
64	Dr. V. Srikanthan	Implanting Cardiologist	205, Sohrab hall , 21 - Sasson road, Pune-21.	Pune	Maharashtra	West
65	Dr. Mahendra Kawedia	Consulting Physician	2144 New Modikhana, Camp, Pune - 1	Pune	Maharashtra	West
66	Dr. RS Kiwalkar	Consulting Physician	A-61 Puru Society, Airport Rd, Pune - 32	Pune	Maharashtra	West
67	Dr. Govind Kulkarni	Consulting Physician	Shree hospital, Nagar Road, Pune	Pune	Maharashtra	West
68	Dr. I. U. Bamb	Consulting Physician	Modern Bakery chowk, Nana Peth , Pune 411011	Pune	Maharashtra	West
69	Dr. R. Sethiya	Consulting Physician	Upper GI Endoscopy Clinic, Neeta Park, Near Gunjan Theatre, Airport Road, Yerwada, Pune - 411 006	Pune	Maharashtra	West
70	Dr. G.S. Wander	Implanting Cardiologist	DMCH Hospital, Ludhiana, Punjab	Ludhiana	Punjab	North
71	Dr. Vitull Gupta	Consulting Physician	Kishori lal hospita+D126Ik, Bhatinda, Punjab	Bhatinda	Punjab	North
72	Dr. Gursharan Singh	Consulting Physician	GS Heart Care, Ludhiana, Punjab	Ludhiana	Punjab	North
73	Dr. M.M. Bansal	Consulting Physician	Gurunanak Hospital, Bhatinda Road, Mukatsar, Punjab	Mukatsar	Punjab	North
74	Dr. Parveen Dhingra	Consulting Physician	Amar Hospital, Ferozpur, Punjab	Ferozpur	Punjab	North
75	Dr. Vikas Kaushal	Consulting Physician	Mandi Gobindgarh, Punjab	Ludhiana	Punjab	North



## Appendix B. Consulting Physician Case Report Forms (CP CRF).

PANARhythmia and Heart Failure Registry Physician Case Report Form		Patient ID				Page 01 of 02	
<b>Administration &amp; Patient Demographics</b>							
Name of physician							
Patient status	<input type="checkbox"/> Outpatient	<input type="checkbox"/> Inpatient					
Date patient data release signed	-					( dd-mmm- yyyy )	
Age _ years	Gender	<input type="checkbox"/> Male	<input type="checkbox"/> Female				
<b>Patient Symptoms</b> (please tick all that apply)							
<input type="checkbox"/> Syncope		<input type="checkbox"/> Pre-syncope					
<input type="checkbox"/> Palpitations with		<input type="checkbox"/> sweating	<input type="checkbox"/> angina	<input type="checkbox"/> no symptoms		<input type="checkbox"/> other	
<input type="checkbox"/> Dyspnea grade $\geq$ NYHA Class II		Past dyspnea if worse		<input type="checkbox"/> NYHA Class III	<input type="checkbox"/> NYHA Class IV		
<input type="checkbox"/> Fatigue - moderate to severe							
<input type="checkbox"/> Other/Comments, please specify (optional):							
<b>Cardiovascular &amp; Co-morbidity Profile</b> (please tick all that apply)							
Left ventricular ejection fraction via Echo (for patients with Stage B, C or D heart failure)						%	
<input type="checkbox"/> Coronary artery disease		<input type="checkbox"/> Diabetes		<input type="checkbox"/> Hypertension			
<input type="checkbox"/> Myocardial infarction		<input type="checkbox"/> Prior stroke					
<input type="checkbox"/> Recent ( $\leq$ 6 weeks)		<input type="checkbox"/> Old ( $>$ 6 weeks)		<input type="checkbox"/> Recent ( $\leq$ 6 weeks)		<input type="checkbox"/> Old ( $>$ 6 weeks)	
<input type="checkbox"/> Dyslipidemia (Cholesterol $>$ 200mg/dl, Triglycerides $>$ 150 mg/dl, LDL $>$ 130 mg/dl)						<input type="checkbox"/> Unknown	
<input type="checkbox"/> Other/Comments, please specify (optional):							
<b>Bradyarrhythmia Evaluation</b> (please tick all that apply and attach ECG)							
<input type="checkbox"/> Sinus bradycardia, including sinus pauses with symptoms							
<input type="checkbox"/> Bradycardia with junctional escape rhythm with symptoms							
<input type="checkbox"/> 3° AV Block with symptoms and/or escape rate less than 40 bpm							
<input type="checkbox"/> 2° AV Block – Type 2 with symptoms and/or escape rate less than 40 bpm							
<input type="checkbox"/> 2° AV Block – Type 1 with symptoms							<input type="checkbox"/> 1° AV Block with symptoms
<input type="checkbox"/> Chronic atrial fibrillation with symptomatic bradycardia							
<input type="checkbox"/> Suspected hypersensitive carotid sinus syndrome							
<input type="checkbox"/> Other, please specify :							
<input type="checkbox"/> Patient referred to cardiologist for further evaluation & treatment							<input type="checkbox"/> Yes <input type="checkbox"/> No
If patient is potentially suffering from symptomatic bradycardia but is not referred, please explain why :							
<input type="checkbox"/> Comments & drug therapy prescribed (optional):							
<b>Supraventricular Tachyarrhythmia Evaluation</b> (please tick all that apply & attach ECG)							
<input type="checkbox"/> Atrial fibrillation			<input type="checkbox"/> Atrial flutter				
<input type="checkbox"/> Atrial tachycardia			<input type="checkbox"/> Paroxysmal supraventricular tachycardia (PSVT)				
<input type="checkbox"/> Other, please specify :							
<input type="checkbox"/> Patient referred to cardiologist for further evaluation & treatment							<input type="checkbox"/> Yes <input type="checkbox"/> No
If patient is potentially suffering from supraventricular tachyarrhythmia amenable to radiofrequency ablation or pacemaker treatment but is not referred, please explain why :							
<input type="checkbox"/> Comments & drug therapy prescribed (optional):							
<b>Heart Failure &amp; Ventricular Dyssynchrony Evaluation</b> (please tick all that apply and attach ECG documentation for all ECG related parameters)							
Heart Failure		<input type="checkbox"/> Stage B	<input type="checkbox"/> Stage C	<input type="checkbox"/> Stage D			
NYHA Class		<input type="checkbox"/> Class I	<input type="checkbox"/> Class II	<input type="checkbox"/> Class III	<input type="checkbox"/> Class IV		
Sinus rhythm QRS duration = _		ms					
Left ventricular ejection fraction = _		%					

<b>PANARhythmMia and Heart Failure Registry</b> <b>Physician Case Report Form</b>		Patient ID <span style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></span> <span style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></span> <span style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></span> <span style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></span>	Page 02 of 02
<input type="checkbox"/> Left bundle branch block		<input type="checkbox"/> Right bundle branch block	
<input type="checkbox"/> Neither			
<input type="checkbox"/> Other, please specify :			
<input type="checkbox"/> Patient referred to cardiologist for further evaluation & treatment		<input type="checkbox"/> Yes <input type="checkbox"/> No	
If patient is potentially suffering from heart failure amenable to treatment by Cardiac Resynchronization Therapy* but is not referred, please explain why :			
<input type="checkbox"/> Comments & drug therapy prescribed (optional):			
* NYHA III, IV patients, Sinus rhythm QRS width $\geq 120$ ms & LVEF $\leq 35\%$ could benefit from CRT			
<b>Sudden Cardiac Arrest Risk Evaluation</b> (please tick all that apply and attach ECG and echo documentation as specified in the footnote)			
<input type="checkbox"/> Cardiac arrest survivor due to ventricular fibrillation/ventricular tachycardia <sup>1</sup>			
<input type="checkbox"/> Sustained ventricular tachycardia <sup>1</sup>			
<input type="checkbox"/> Prior MI (> 40 days ago), EF < 40%, non-sustained ventricular tachycardia <sup>2</sup>			
<input type="checkbox"/> Prior MI (> 40 days ago), EF < 35%, NYHA Class II, III <sup>2</sup>			
<input type="checkbox"/> Prior MI (> 40 days ago), EF < 30%, Stage B heart failure <sup>2</sup>			
<input type="checkbox"/> Non-ischemic dilated cardiomyopathy with EF $\leq 35\%$ , NYHA Class II, III <sup>2</sup>			
<input type="checkbox"/> Long QT syndrome <sup>1</sup>			
<input type="checkbox"/> Other, please specify :			
<input type="checkbox"/> Patient referred to cardiologist for further evaluation & treatment		<input type="checkbox"/> Yes <input type="checkbox"/> No	
If patient is at high risk for Sudden Cardiac Arrest and a potential candidate for ICD Therapy but is not referred, please explain why			
<input type="checkbox"/> Comments & drug therapy prescribed (optional):			
<small>1- ECG documentation required, 2- ECG &amp; Echo documentation required</small>			
<b>Disease etiology</b> (please tick all that apply)			
<input type="checkbox"/> Coronary artery disease		<input type="checkbox"/> Hypertension	
<input type="checkbox"/> Rheumatic valvular heart disease		<input type="checkbox"/> Infectious disease	
<input type="checkbox"/> Degenerative disease		<input type="checkbox"/> Idiopathic	
<input type="checkbox"/> Congenital heart disease		<input type="checkbox"/> Primary electrical disease	
<input type="checkbox"/> Iatrogenic disease		<input type="checkbox"/> Unknown etiology	
<input type="checkbox"/> Other/Comments, please specify (optional):			
<b>Referral Status</b> (please complete sections B,C for all referred patients)			
A. Patient referred to cardiologist for further evaluation & treatment?		<input type="checkbox"/> Yes <input type="checkbox"/> No	
B. Has the patient information been included in the Referred Patient Log?		<input type="checkbox"/> Yes <input type="checkbox"/> No	
If not, Please explain why:			
C. Patient counseling on potential disease & interventional treatment option (please tick all that apply)			
<input type="checkbox"/> Discussion with patient conducted			
<input type="checkbox"/> Disease & therapy brochure provided			
<input type="checkbox"/> List of internet websites providing information about disease & intervention provided			
<input type="checkbox"/> Other, please specify :			
<input type="checkbox"/> If none of the above, please explain why :			
_____ Signature of Physician		Date of signature <span style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></span> <span style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></span> <span style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></span> <span style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></span> <span style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></span> <span style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></span> <span style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></span> <span style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></span> 2 0 _____ D D M M M Y Y Y Y	

<b>PANARrhythMia and Heart Failure Registry</b>	<b>Patient ID</b> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
<b>Patient Referral Form</b>	

*Completion of this form is optional*

.....  
 Please complete this section for all referred Patients, tear off the Patient Copy and handover to the Patient to present upon consultation to Cardiologist along with the Patient Copy of the Case Report Form and ECG/Echo reports :  
 .....X..... X.....

**Patient Referral Form - Panarrhythmia & Heart Failure Registry**

Patient ID <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	
Patient has been referred for possible treatment with :	
<input type="checkbox"/> Pacemaker implantation <input type="checkbox"/> Radiofrequency ablation <input type="checkbox"/> Implantable defibrillator implantation <input type="checkbox"/> Cardiac Resynchronization Therapy	
Patient has been counselled on potential disease and treatment option <input type="checkbox"/> Yes <input type="checkbox"/> No	
Patient has been provided with the Patient Copy of the RP CRF <input type="checkbox"/> Yes <input type="checkbox"/> No	
Patient has been instructed to present a copy of the RP CRF, ECG and Echo reports to the implanting cardiologist upon consultation <input type="checkbox"/> Yes <input type="checkbox"/> No	
Date Referred <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <u>2</u> <u>0</u> <input type="text"/> <input type="text"/>	
D D M M M Y Y Y Y	
Cardiologist details <i>(Optional)</i>	
Name: _	
Address: _	
Telephone: Office_	Mobile _
_____	Date of signature <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <u>2</u> <u>0</u> <input type="text"/> <input type="text"/>
Signature of Physician	D D M M M Y Y Y Y



<b>PANARrhythmMia and Heart Failure Registry</b>		Patient ID	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	Page 02 of 02
<b>Potential Therapy Requirement</b>				
<input type="checkbox"/> No interventional therapy required	<input type="checkbox"/> ICD therapy for SCA prevention			
<input type="checkbox"/> Single chamber pacemaker for bradycardia	<input type="checkbox"/> Dual chamber pacemaker for bradycardia			
<input type="checkbox"/> CRT -P for heart failure	<input type="checkbox"/> CRT -D for heart failure			
<input type="checkbox"/> RF ablation for VT	<input type="checkbox"/> RF ablation for SVT			
<input type="checkbox"/> Other, please specify				
<b>Disease etiology</b> (please tick all that apply)				
<input type="checkbox"/> Coronary artery disease	<input type="checkbox"/> Hypertension			
<input type="checkbox"/> Rheumatic valvular heart disease	<input type="checkbox"/> Infectious disease			
<input type="checkbox"/> Degenerative disease	<input type="checkbox"/> Idiopathic			
<input type="checkbox"/> Congenital heart disease	<input type="checkbox"/> Primary electrical disease			
<input type="checkbox"/> Iatrogenic disease	<input type="checkbox"/> Unknown etiology			
<input type="checkbox"/> Other, please specify				
Comments on further evaluation/treatment course and patient potential risk status provided as feedback for physician				
<input type="checkbox"/> High Risk <input type="checkbox"/> Medium Risk <input type="checkbox"/> Low Risk				
_____ Signature of cardiologist				
Date of signature <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 2 0 <input type="text"/> <input type="text"/>				
D D M M M Y Y Y Y				

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