IMPACT OF CIED FIELD ADVISORIES ON UNREIMBURSED COSTS TO MEDICAL SYSTEMS
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Background: In the past year multiple CIED manufacturers have issued field advisories (FA).

Objective: We sought to determine the unreimbursed resource requirements and work necessary for responding to FA.

Methods: Nonclinical time spent responding to five FA (Boston Scientific 12-20 and 6-21, Medtronic 2-21, Biotronik 3-21, Abbott 3-21), from a large integrated system that has six clinic locations in four different states in the United States was recorded from 12-20 to 11-21.

Results: Nonclinical time required to respond to FA for each clinic site, number of patients impacted by an FA, and the total number of CIED patients followed for each clinical site is shown in the Table. The specific work involved for responding to an FA varied significantly among sites and for different FA and included: overall planning for the enterprise (16-30%), calling patients (6-11%), care coordination and site-specific meetings (5-22%), documentation in the EHR (6-47%), and letter distribution (50-70%). 11-41% of patients in individual clinics were affected. The time required to respond to the Abbott FA (7 minutes/patient) was significantly less than for Boston Scientific FA (10 minutes/patient) and the Medtronic FA (10 minutes/patient).

Conclusion: Significant resources are required to respond to FA that are not reimbursed. The nonclinical time requirement and specific work for responding to a FA varied depending on site and details of the FA. When required, letter distribution to patients accounted for the largest percentage of time required to respond to an FA.

VARIATION IN HOSPITAL USE OF CRT-D AMONG ELIGIBLE PATIENTS AND ASSOCIATION WITH CLINICAL OUTCOMES
Philip Chui MD; Zhou Lan PhD and Jeptha P. Curtis MD

Background: Although cardiac resynchronization therapy-defibrillator (CRT-D) is a first-line recommendation for select patients, it remains underutilized with substantial variation in use across hospitals. It is unclear how much of this hospital variation is explained by case mix alone and whether this variation is associated with other markers of other clinical metrics of hospital quality such as readmissions and mortality rates.

Objective: The aims of this study are to quantify the degree of variation in patient-level CRT-D usage that can be explained by between-group variation on a hospital level and to assess if observed hospital variations in CRT-D implantation are associated with differences in hospital-level outcomes (mortality, readmissions, and cardiac readmissions rates).

Methods: We linked data from the NCDR ICD registry from 2010 to 2015 with Medicare claims data. We developed multivariable regression models to assess for hospital differences in CRT-D implantation compliance. We calculated the intraclass correlation coefficient to quantify the degree of variation in patient-level CRT usage that can be explained by between-group variation on a hospital level. We subsequently compared pairs of logistic regression and Cox models for our clinical outcomes with one model including the hospital proportion of CRT-D implantations among eligible patients as a second-level predictor and one model did not.

Results: Our analysis included a total of 30,134 patients. The median CRT-D implantation rate among hospitals was 83.2% but there was wide variation across facilities [Figure 1]. After adjustment for case mix and hospital characteristics, the proportion of variation in hospital rates of CRT-D utilization attributable to the patient’s hospital upon implantation was 74%. Hospital CRT-D utilization accounted for 8.76%, 5.26%, and 4.71% of differences in hospital mortality, readmissions, and cardiac readmission rates respectively [Table 1].

Conclusion: There remains wide variation in the use of CRT-D across hospitals that is not explained by case mix. Hospital rates of appropriate implantation of CRT-D can be considered as a performance measure suitable for quality improvement efforts.

<table>
<thead>
<tr>
<th>Clinic Site</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total patients followed (N)</td>
<td>6113</td>
<td>2538</td>
<td>1996</td>
<td>1000</td>
<td>3100</td>
<td>850</td>
<td>15,797</td>
</tr>
<tr>
<td>Number of patients impacted by an FA</td>
<td>1693*</td>
<td>494*</td>
<td>812</td>
<td>320*</td>
<td>334</td>
<td>111</td>
<td>3,764</td>
</tr>
<tr>
<td>Nonclinical Total Hours required to respond to FA</td>
<td>254</td>
<td>74</td>
<td>115</td>
<td>48</td>
<td>57</td>
<td>29</td>
<td>577</td>
</tr>
</tbody>
</table>

Table 1: Association of CRT-D compliance among eligible patients and clinical outcomes

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Proportion of Variation in Outcomes Attributable to Hospital CRT Compliance Rates</th>
<th>P Value</th>
<th>Type of Modeling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mortality</td>
<td>8.70%</td>
<td>0.0011</td>
<td>Logistic Regression (Outcome is Binary)</td>
</tr>
<tr>
<td>All-Cause Readmission</td>
<td>3.26%</td>
<td>0.0097</td>
<td></td>
</tr>
<tr>
<td>Cardiac Readmission</td>
<td>4.71%</td>
<td>0.0011</td>
<td></td>
</tr>
<tr>
<td>Mortality</td>
<td>8.14%</td>
<td>&lt;.0001</td>
<td></td>
</tr>
<tr>
<td>All-Cause Readmission</td>
<td>2.95%</td>
<td>&lt;.0001</td>
<td>Cox Model (Outcome is Time to Event)</td>
</tr>
<tr>
<td>Cardiac Readmission</td>
<td>1.58%</td>
<td>&lt;.0001</td>
<td></td>
</tr>
</tbody>
</table>
ABSTRACT CA-532:
Treatment Strategies for Atrial Fibrillation and Associated Outcomes
Saturday, April 30, 2022
8:00 AM - 9:00 AM

CA-532-01

RISK OF DEMENTIA AMONG PATIENTS WITH ATRIAL FIBRILLATION TREATED WITH CATHETER ABLATION VERSUS ANTI-ARRHYTHMIC DRUGS
Emily P. Zeitler MD, MHS; Jamie L. March MBA; Rahul Khanna BPharm, MBA, PhD; Xiaozhou Fan and Andrea M. Russo MD, FHRS

Background: Atrial fibrillation (AF) is associated with an increased risk of dementia. However, variation in dementia risk by AF rhythm treatment has not been well studied.

Objective: To compare the risk of dementia in patients with AF who underwent catheter ablation (CA) versus anti-arrhythmic drug (AAD) treatment.

Methods: The 2000-2021 Optum Clinformatics database was used and includes national administrative claims of commercially insured non-elderly adults and Medicare Advantage beneficiaries in the US. Patients with AF who underwent CA versus treatment with AADs (>1 prescription fill for ≥2 AADs) were identified. Patients with history of dementia, heart failure, surgical ablation, valvular procedure, or left atrial appendage occlusion were excluded. Propensity score matching was used to match patients in CA versus AAD groups. A cause-specific hazard model was performed to assess dementia risk overall and in sex subgroups.

Results: After matching, there were 15,441 patients per group. Patients treated with CA had 24% lower risk of dementia compared with those treated with AAD (1.8% vs 3.2%; hazard ratio [HR] 0.76, 95% confidence interval [CI] 0.66-0.88, p=0.0003) (Figure 1). In males, the dementia risk did not differ significantly among CA versus AAD patients (1.5% vs 2.2%, HR 0.81, 95% CI 0.66-1.00, p=0.0523). Among females, those treated with CA demonstrated a 27% lower risk of dementia compared with those treated with AAD (2.4% vs 4.4%, HR 0.73, 95% CI 0.59-0.90, p=0.0038). Conclusion: Patients with AF treated with CA had significantly lower risk of dementia compared with those treated with AADs. The lower risk of dementia in CA versus AAD treated patients was particularly prominent among females.

CA-532-02

ATRIAL UPTAKE OF TECHNETIUM-99M-PYROPHOSPHATE IS ASSOCIATED WITH INCREASED ARRHYTHMIA RECURRENCE FOLLOWING AFABLATION
Eoin Donnellan MD; Wael A. Jaber MD; Divyang Rajesh Patel MD; Mohamed Kanj MD; Mazen Hanna and Oussama M. Wazni MD

Background: Atrial amyloidosis is an arrhythmogenic substrate for atrial fibrillation (AF). Technetium-99m-pyrophosphate (99mTc-Pyp), known to bind calcium, was originally developed as a bone tracer. It was subsequently demonstrated that 99mTc-Pyp correlated with areas of calcium deposition in injured and necrotic myocytes. Assessment of atrial uptake (AU) of 99mTc-Pyp is currently not utilized clinically but may provide important insights into the likelihood of success of rhythm control strategies among individuals with AF.

Objective: To examine the association between AU on 99mTc-Pyp scan and maintenance of normal sinus rhythm following AF ablation.

Methods: We studied 620 patients who were referred for a 99mTc-Pyp scan for suspected transthyretin cardiac amyloidosis between January 2012 and September 2019. Of these patients, 55 subsequently underwent AF ablation and were included in our final analyses. Presence or absence of AU was assessed using Corridor 4DM® software and Syngo Via® using fused/co-registered computed tomographic single photon emission computed tomography imaging in all cases. AU was defined as qualitative uptake in the atrial walls distinct from the blood pool. A representative example of AU is shown in Figure 1b. A 2-sided p-value <0.05 was considered statistically significant.

Results: Baseline characteristics are shown in Figure 1a and were similar between those with and without AU. Following ablation, 34/55 (62%) developed recurrent arrhythmia and the mean time to recurrence was 28 months. Among those with AU on 99mTc-Pyp scan, 21/25 (84%) experienced arrhythmia recurrence, compared to 13/30 (43%) of those without AU (Figure 1c, log-rank 5.4, p=0.02). On multivariable models adjusting for AF type, the presence or absence of cardiac amyloidosis, and left ventricular ejection fraction, AU was a significant predictor of recurrent arrhythmia (HR 2.6, 95% CI 1.2-5.3, p=0.016).

Conclusion: Atrial myopathy is the result of a variety of factors that lead to structural and electrical remodeling in the atrium and portends a poorer prognosis with respect to rhythm control among patients with AF. AU of 99mTc-Pyp may identify patients at higher risk for arrhythmia recurrence following AF ablation.