

SUMMARY

Economic Impact of Atrial Fibrillation Ablation with Radiofrequency Contact Force Catheter versus Cryoballoon Catheters

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Journal of Comparative Effectiveness Research (doi.org/10.2217/ceer-2018-0112)

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BACKGROUND

Catheter ablation of atrial fibrillation (AFib) is commonly performed using either radiofrequency energy or cryoenergy. Two of the most commonly used ablation catheters include the radiofrequency contact-force (CF) catheter and the Cryoballoon (CB) catheter. Studies examining these two catheters have found that both catheters are highly effective in the treatment of AFib.

BENEFITS ASSOCIATED WITH USE OF CONTACT FORCE CATHETERS:



REDUCED INCIDENCE
OF PULMONARY VEIN
RECONNECTION¹

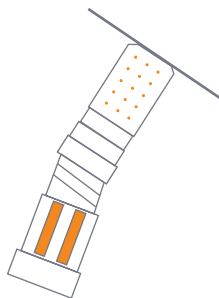


LOW ADVERSE
EVENT RATES¹

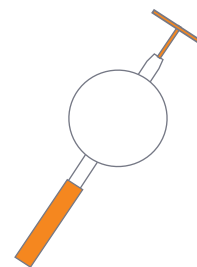


HIGH 12-MONTH
SUCCESS RATE¹

Few studies have compared outcomes between AFib patients treated with CF catheters (such as the THERMOCOOL® SMARTTOUCH Catheter) versus CB catheters in a real-world setting. This study utilized the Premier Healthcare Database, a nationally representative U.S. hospital database, **to retrospectively examine differences in healthcare resource utilization between AF patients treated with the THERMOCOOL SMARTTOUCH® Catheter and Arctic Front™ / Arctic Front™ Advanced Cryoballoon Catheters.**



**THERMOCOOL® SMARTTOUCH
CATHETER (CF)**



**ARCTIC FRONT™ / ARCTIC
FRONT™ ADVANCED CARDIAC
ABLATION CATHETERS (CB)**

METHODS

STUDY OBJECTIVE

Compare healthcare costs and health resource utilization over a 1-year period between AFib patients treated with CF or CB catheters.

PRIMARY OUTCOMES



COST

1. Total hospital cost
2. Total supply cost



INPATIENT STAY COSTS

1. Length of Stay
2. Room and board cost

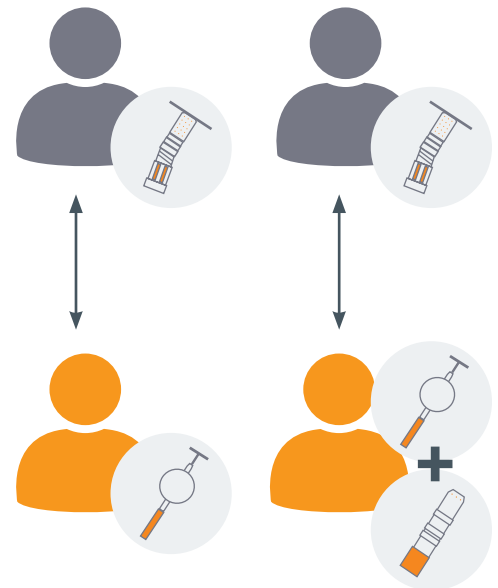


READMISSIONS

1. All cause readmissions
2. CV-related readmissions
3. AF-related readmissions

STUDY DESIGN & KEY FEATURES

- Retrospective, observational database study
- Data from the Premier Healthcare Database, a nationally representative database including over 700 U.S. hospitals, was used in this study
- In the primary analysis, patients receiving catheter ablation for AFib between 2014-2017 using either the CF or CB catheters were compared
- In the secondary analysis, outcomes in the CF catheter group were compared to patients in the CB catheter group, with additional point-by-point catheter use.



METHODS

- Propensity matching was used to match patients in the two groups on demographic, procedural, hospital, and comorbidity characteristics, and compared using regression analysis.
 - Match variables included: age, Charlson Comorbidity Score, CHA₂DS₂ score, pre-existing heart disease, and pace-maker or defibrillator use in the 12 month pre-index period.
- Events in the 4- to 12-month period after the discharge from the index admission were measured
- Sensitivity analyses were performed to account for centers that have performed 100 ablation procedures or more, as these providers have been demonstrated to be associated with superior ablation outcomes.

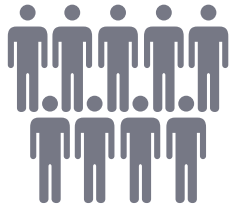
INCLUSION CRITERIA

- Age ≥18 years
- Non-zero cost at index admission
- Providers with 12 months of pre-index data and post-index data in Premier
- Ablation performed with either the CF THERMOCOOL SMARTTOUCH® Catheter or the CB Arctic Front™/ Arctic Front Advance™ Catheter

EXCLUSION CRITERIA

- Patients with a catheter ablation procedure during the 12 months prior to the index admission
- Patients who underwent surgical ablation concomitantly with open heart surgery for valvular, ischemic or congenital heart disease, valvular procedures or left atrial appendage occlusion during the 12-month pre-index admission

RESULTS



STUDY POPULATION

- Final study population was 3,715 patients for the primary analysis
 - CF cohort: 1,409 patients and CB cohort: 2,306 patients
- Final study population was 4,466 patients for the secondary analysis
 - CF cohort: 1,409 patients and CB with point-by-point touchup cohort: 3,057 patients

For the primary analysis, the CF and CB cohorts were compared at a follow-up of 12 months:

	HOSPITAL COSTS		INPATIENT STAY COSTS		4-12 MONTH INPATIENT READMISSIONS		
	TOTAL INDEX ABLATION COST	TOTAL SUPPLY COST	LENGTH OF STAY	ROOM AND BOARD COST	ALL-CAUSE READMISSIONS	CV-RELATED READMISSIONS	AF-RELATED READMISSIONS
CF Cohort	\$23,281	\$9,948	3.16 days	\$4,148	6.15%	4.47%	2.51%
CB Cohort	\$24,934	\$11,338	2.86 days	\$3,650	12.01%	6.70%	4.47%
Difference	\$1,653*	\$1,390*	0.3 days	\$498	5.86%†	2.23%†	1.96%

* Indicates a statistically significant difference in bivariate analysis ($p < 0.05$)

† Indicates a statistically significant difference in multivariate regression analysis ($p < 0.05$)

The primary analysis showed that compared to CB catheters, ablation with CF catheters was associated with approximately:



7% LOWER TOTAL INDEX ABLATION COSTS



13% LOWER TOTAL SUPPLY COSTS



55% LOWER ODDS OF ALL-CAUSE INPATIENT READMISSION



39% LOWER ODDS OF CV-RELATED INPATIENT READMISSION

RESULTS

For the secondary analysis, the CF and CB plus point-by-point (PBP) touchup cohorts were compared at a follow-up of 12 months.

	HOSPITAL COSTS		INPATIENT STAY COSTS		4-12 MONTH INPATIENT READMISSIONS		
	TOTAL INDEX ABLATION COST	TOTAL SUPPLY COST	LENGTH OF STAY	ROOM AND BOARD COST	ALL-CAUSE READMISSIONS	CV-RELATED READMISSIONS	AF-RELATED READMISSIONS
CF Cohort	\$23,271	\$9,950	3.10 days	\$4,142	6.57%	4.72%	2.47%
CB Plus PBP Cohort	\$25,766	\$12,077	3.05 days	\$3,870	9.21%	5.84%	3.60%
Difference	\$2,495*	\$2,127*	0.05 days	\$272	2.64%	1.12%	1.13%

* Indicates a statistically significant difference in bivariate analysis (p < 0.05)

The secondary analysis showed that compared to CB catheters with point-by-point touchup, ablation with CF catheters was associated with approximately:



10% LOWER TOTAL INDEX ABLATION COSTS



18% LOWER TOTAL SUPPLY COSTS

Results from the sensitivity analyses showed that use of the CF catheter was associated with lower total index ablation costs and total supply costs compared to the CB group, and no significant differences in length of stay or room and board costs.

DISCUSSION AND CONCLUSION



Study limitations include potential selection biases and inability to account for physician level differences. However, **propensity score matching and regression analysis was used to reduce biases.**

Compared with AFib patients treated with Arctic Front™ / Arctic Front™ Advanced Cryoballoon Catheters, ablation using THERMOCOOL SMARTTOUCH® CF catheters was associated with:

Up to **10%** lower total ablation costs

Up to **18%** lower total supply costs

Up to **55%** lower odds of all-cause inpatient readmission

Up to **29%** lower odds of CV-related inpatient readmission

KEY TAKEAWAY



This study demonstrated that in a real-world setting, use of THERMOCOOL® SMARTTOUCH CF catheters in AFib ablation significantly lowered total hospital costs, and resulted in a lower likelihood of all-cause and CV-related inpatient readmissions as compared to Arctic Front™ / Arctic Front™ Advanced Cryoballoon Catheters.

References:

1. Andrade JG, Monir G, Pollak SJ et al. Pulmonary vein isolation using 'contact force' ablation: the effect on dormant conduction and long-term freedom from recurrent atrial fibrillation – a prospective study. Heart Rhythm 11(11), 1919–1924 (2014).