

Summary

Real-World Economic and Clinical Outcomes in Catheter Ablation of Atrial Fibrillation: Contact Force Porous Tip Catheter versus Second-Generation Cryoballoon Catheter

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STUDY QUESTION

How do clinical and economic outcomes differ between AF patients ablated with the THERMOCOOL SMARTTOUCH® SF Catheter compared to the Arctic Front™ Advance Cryoballoon?

METHODOLOGY

DATA SOURCE: PREMIER HEALTHCARE DATABASE



A nationally representative database of over 700 U.S. hospitals, capturing ~20% of all discharges in the US

Design: Retrospective, observational cohort study

Population: AF patients undergoing catheter ablation using the THERMOCOOL SMARTTOUCH® SF Catheter or Arctic Front Advance™ Cryoballoon catheters

Analysis: Patients were matched using 1:1 propensity score matching. Outcomes were compared among the matched cohort using generalized estimating equation (GEE).

OUTCOMES



HOSPITAL COSTS

1. Total index ablation cost
2. Total supply cost
3. Room and board cost



INPATIENT LENGTH OF STAY



READMISSIONS

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



REPEAT ABLATION



DIRECT CURRENT CARIOVERSION

RESULTS

TOTAL PATIENT POPULATION

848
PATIENTS

were matched in each cohort for the hospital cost analysis

HOSPITAL COSTS

Use of the THERMOCOOL SMARTTOUCH® SF Catheter was associated with lower hospital costs compared to Arctic Front Advance™ Cryoballoon catheters



17% Lower Total Index Ablation Costs



27% Lower Total Supply Costs

TOTAL PATIENT POPULATION

568
PATIENTS

were matched in each cohort for readmission, direct current cardioversion (DCCV) and re-ablation analysis

READMISSIONS

Use of the THERMOCOOL SMARTTOUCH® SF Catheter was associated with fewer cardiovascular related readmissions compared to Arctic Front Advance™ Cryoballoon catheters



54%

lower likelihood of 4-6 month cardiovascular related inpatient admissions

CONCLUSION



This study demonstrated that use of the **THERMOCOOL SMARTTOUCH® SF Catheter** in AF ablation provides considerable **economic and clinical benefit** to as compared to the Arctic Front Advance™ Cryoballoon.

OBJECTIVE

The objective of this study was to compare **clinical and economic outcomes** between patients undergoing AF ablation using either the **THERMOCOOL SMARTTOUCH® SF Catheter** or the **Arctic Front Advance™ Cryoballoon**.

METHODS

Experimental Design

STUDY DESIGN	Retrospective, observational cohort study
DATA SOURCE	Data from the Premier Healthcare Database (PHD) was used to identify patients with AF who underwent ablation using the THERMOCOOL SMARTTOUCH® SF Catheter or the Arctic Front Advance™ Cryoballoon catheter
ANALYSIS	<ul style="list-style-type: none">• Two groups of patients (THERMOCOOL SMARTTOUCH® SF Catheter group and Arctic Front Advance™ Cryoballoon catheter group) were matched on study covariates using 1:1 propensity score matching• Matching characteristics: Patient demographics, Charlson Comorbidity Index (CCI), hospital setting, year of index ablation, hospital characteristics (teaching status, bed size, region, physician specialty)• Study outcomes were examined and compared using generalized estimating equation• Sensitivity analyses were conducted to account for any difference in patient outcomes as a result of hospital volumes

INCLUSION CRITERIA	EXCLUSION CRITERIA
<ul style="list-style-type: none">• Age ≥18 years• Patients with AF who underwent catheter ablation using either the THERMOCOOL SMARTTOUCH® SF Catheter or the Arctic Front Advance™ Cryoballoon catheter• Patients who had index ablation with providers who continuously provided data to PHD in the 12-months pre-index period	<ul style="list-style-type: none">• Any cardiac ablation, valvular procedure, or left atrial appendage occlusion procedure in the 12-month pre-index period• \$0 listed total supply cost or \$0 room and board cost (for inpatient ablation)

OUTCOMES



HOSPITAL COSTS

1. Total index ablation cost
2. Total supply cost
3. Room and board cost



INPATIENT LENGTH OF STAY



READMISSIONS

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



REPEAT ABLATION



DIRECT CURRENT CARDOVERSION

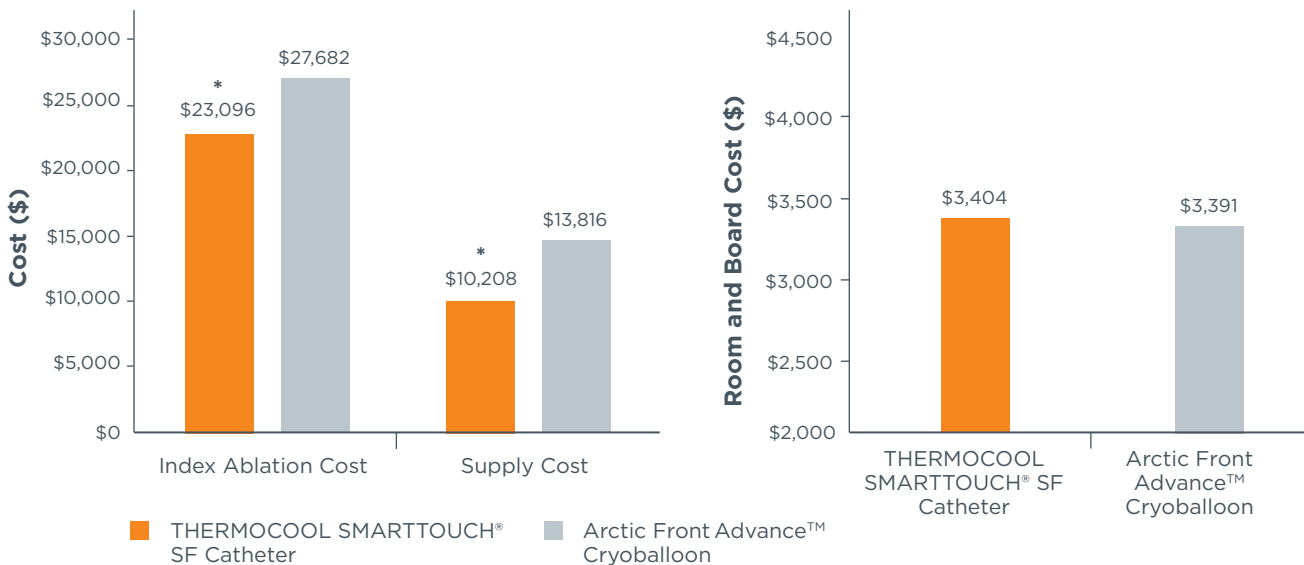
PATIENT POPULATION

In total, 3,015 patients met the study criteria. A higher proportion of patients in the THERMOCOOL SMARTTOUCH® SF Catheter group had a CCI score of ≥ 2 , sleep apnea, obesity, atrial flutter, other arrhythmias, valvular disease, cardiomyopathy, ischemic heart disease//MI, hypertension and CHF.

- **848 patients** were matched in each cohort for the hospital cost analysis
- **568 patients** were matched in each cohort for readmission, direct current cardioversion (DCCV) and reablation analysis

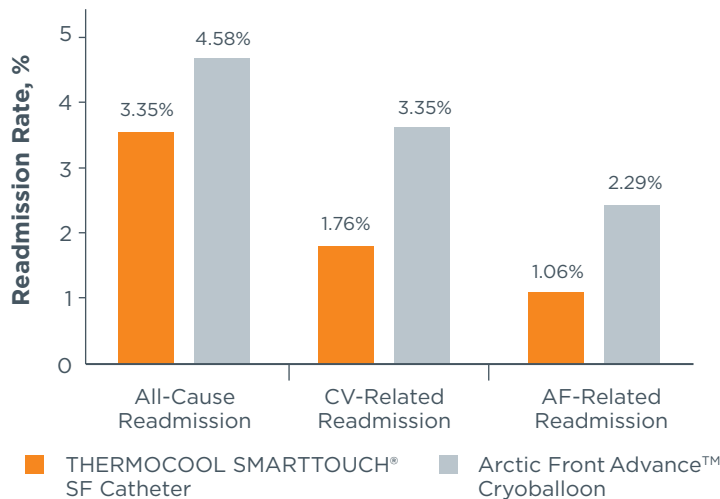
STUDY OUTCOMES

Compared to the Arctic Front Advance™ Cryoballoon cohort, the **THERMOCOOL SMARTTOUCH® SF Catheter cohort had -17% lower total index ablation procedure costs and -27% lower supply costs.** There were no significant differences in room and board costs among the two cohorts.

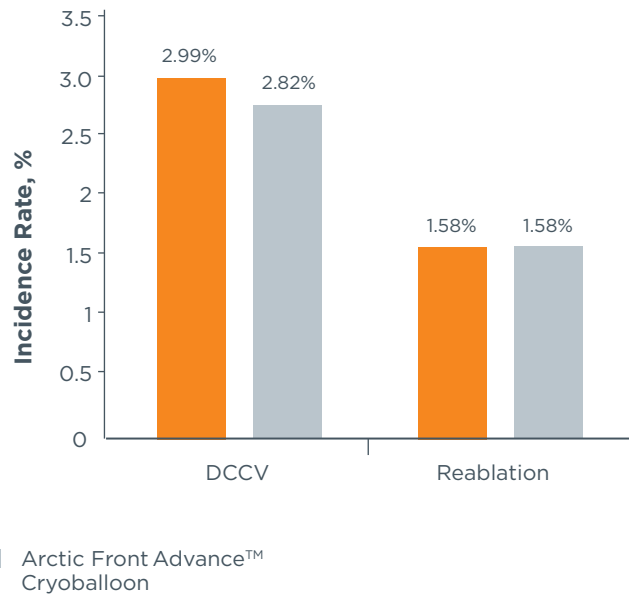
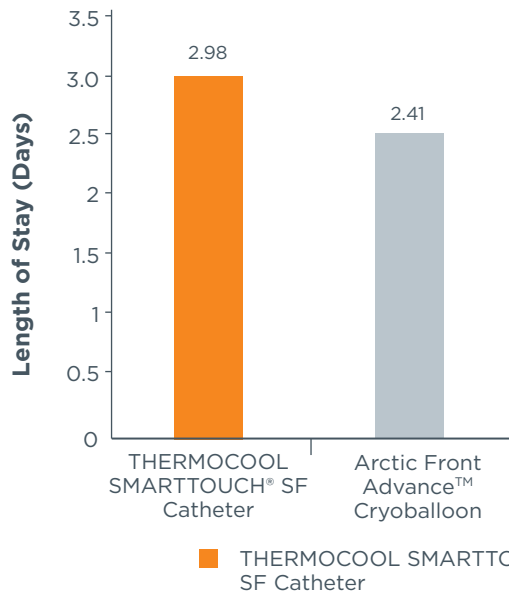


*Indicates statistically significant difference; $p < 0.0001$

The analysis showed a **54% lower likelihood of CV-related inpatient admissions** in the 4-6 months post-index ablation period among THERMOCOOL SMARTTOUCH® SF Catheter patients compared to Arctic Front Advance™ Cryoballoon patients.



* indicates statistically significant difference; $p < 0.05$



No statistically significant differences ($p > 0.05$) were observed in length of stay, rates of direct current cardioversion and reablation between the THERMOCOOL SMARTTOUCH® SF Catheter and Arctic Front Advance™ Cryoballoon catheter cohorts.

Sensitivity analysis conducted by restricting patient sample from hospitals with at least 100 ablation procedures in the 1-year pre-index period showed significantly lower total cost and supply cost for THERMOCOOL SMARTTOUCH® SF Catheter patients. No difference in all-cause and AF-related readmission, repeat ablation or DCCV was observed.

STUDY LIMITATIONS



Study limitations include possible selection bias, use of text search strategy, and billing and claims errors. Propensity score matching was used to reduce biases. Additionally, the THERMOCOOL SMARTTOUCH® SF Catheter was released in late 2016 and long-term outcomes could not be studied at this time.

CONCLUSION



When compared to the Arctic Front Advance™ Cryoballoon catheter, the THERMOCOOL® SMARTTOUCH SF Catheter was associated with lower total index ablation costs, reduced supply costs, and lower likelihood of 4-5 months CV-related readmission. Our study demonstrated that the **THERMOCOOL® SMARTTOUCH SF Catheter** offers considerable economic savings to providers and significant health benefits to patients as compared to the Arctic Front Advance™ Cryoballoon catheter.