SUMMARY

Cost Minimization Analysis of Catheter Ablation for Paroxysmal Atrial Fibrillation by Catheter Technology

Jose Osorio, Ryan J. Imhoff, Peter J. Mallow, Tina D. Hunter, Laura Goldstein, Anil Rajendra, Gustavo Morales

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BACKGROUND

Catheter ablation of atrial fibrillation with contact-force technology has repeatedly demonstrated to be safe, efficacious and have the lowest observed rates of repeat ablation, as compared to other technologies.[1]

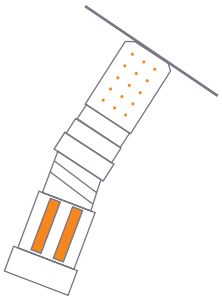
IMPROVED SAFETY OUTOMES[1]

REDUCED RATE OF REPEAT ABLATION[1]

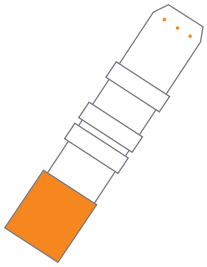
LOWER PROCEDURE COSTS[2]

Previous analyses showed that the **THERMOCOOL SMARTTOUCH® Catheter significantly reduces the rate of repeat ablation at one year as compared to earlier RF technologies and to 2nd generation cryoballon technologies.[1]**

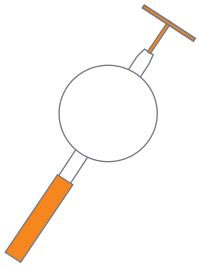
This study was developed to better understand how index procedure cost as well as 12 month patient outcomes influence total cost of care. An economic model was created using clinical outcomes data from a single high volume center and cost data from the Premier Perspective Hospital Database.



CONTACT FORCE CATHETER



NON-CONTACT FORCE CATHETER



CRYOABLATION CATHETER

An economic model was developed and used to evaluate which technology among the THERMOCOOL SMARTTOUCH® Catheter, THERMOCOOL® SF Catheter and the Arctic Front Advance™ Cardiac Cryoablation Catheter resulted in the **lowest overall 12 month cost.**

METHODS

STUDY OBJECTIVE

With the use of real-world data from a single high-volume center as well as retrospective hospital cost data from a large database, **this study sought to evaluate the costs of AFib ablation with the THERMOCOOL SMARTTOUCH® Catheter (ST), THERMOCOOL® SF Catheter (SF) and Arctic Front Advance™ Cardiac Cryoablation Catheter (CB), and to estimate the cost minimizing strategy for AFib ablation procedures from a hospital perspective.**

PRIMARY OUTCOMES

1. **Cost of the initial catheter ablation visit**
2. **Cost of repeat ablation during the first year**

STUDY DESIGN

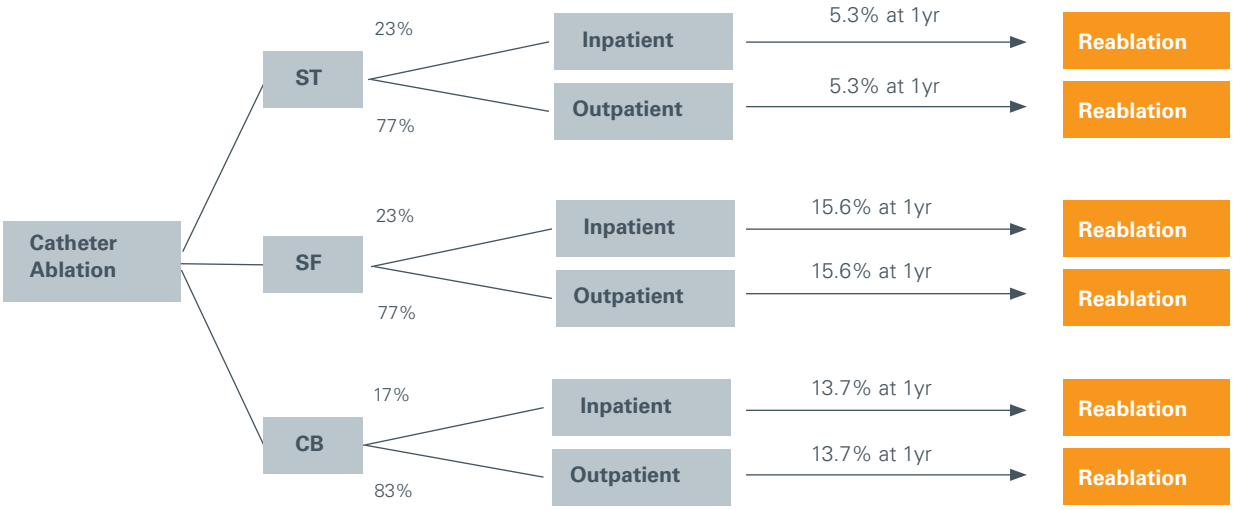
- A decision tree model allowing the observation of outcomes in different simulated scenarios was developed.
- Using the decision tree model, cost outcomes were compared between ablations using ST vs. SF, and ablations using ST vs. CB.
- Three models were developed to evaluate the ablations in different settings:

  Model 1: Mix of inpatient and outpatient procedures (typical hospital practice)

  Model 2: Inpatient procedures only

  Model 3: Outpatient procedures only

Example: Decision Tree Model for Model 1



METHODS

Example: Decision Tree Model for Model 1 contd.

Values used to create decision tree models were obtained from a single, high volume center.

MODEL INPUTS	
MODEL PARAMETER	**RATE**
ST (n=277)	
Reablation Rate	5.3%
Proportion of Inpatient Procedures	23.2%
SF (n=43)	
Reablation Rate	15.6%
Proportion of Inpatient Procedures	23.2%
CB (n=63)	
Reablation Rate	13.7%
Proportion of Inpatient Procedures	17.3%

KEY FEATURES

- Acute procedural success and adverse event rates were previously shown and assumed to be similar across all three catheters
- Reablation rates were populated using data from a retrospective single site study of 383 ablations
- Reablations were assumed to be performed with an SF catheter to be economically conservative
- Cost data (index ablation cost and re-ablation cost) were obtained from a retrospective analysis of 2,537 ablations in the Premier Hospital Database, a nationally representative database of 700 hospitals
- Model parameters were varied and additional trials were simulated in two sensitivity analysis to evaluate the robustness of the results.

RESULTS

Ablation with the THERMOCOOL SMARTTOUCH® Catheter was found to generate significant cost savings in both the inpatient and outpatient setting compared to THERMOCOOL® SF Catheter and Arctic Front Advance™ Cardiac Cryoablation Catheter.

Average Expected 12-month Ablation Costs

	SF	CB	ST
HOSPITAL MIX	$25,888	$28,894	$24,400
INPATIENT ONLY	$27,698	$34,141	$25,935
OUTPATIENT ONLY	$25,340	$27,794	$23,935

Cost Savings Associated With Use of THERMOCOOL SMARTTOUCH® Catheter

	HOSPITAL MIX	OUTPATIENT ONLY	INPATIENT ONLY
ST vs. CRYOBALLOON	$4,494	$3,859	$8,206
ST vs. THERMOCOOL SF	$1,488	$1,405	$1,763

Use of the **THERMOCOOL SMARTTOUCH® Catheter generated the largest cost savings when compared to the cryoballoon,** especially in an inpatient setting.

In the sensitivity analyses, **THERMOCOOL SMARTTOUCH® Catheter was associated with cost savings at all tested parameter values and in ≥99.6% of all tested iterations.**

DISCUSSION AND CONCLUSION

STUDY LIMITATIONS

1. Clinical data used in this study are based on the results of a **single, non-randomized site.**
2. This study was designed from the **perspective of a U.S. hospital,** and may not be generalizable outside these settings.
3. The model **does not consider the possibility of multiple repeat ablations or use of multiple technologies** during the initial procedure.

Overall, when compared to patients treated with SF or Cryo, AFib patients treated with ablation had:

- Lower cost of index procedure
- Lower repeat ablation rates
- Lower 12-month treatment costs

In a center that performs 100 ablations per year, use of THERMOCOOL SMARTTOUCH® generates potential cost savings of:

$148,000
COMPARED TO THERMOCOOL® SF

$449,400
COMPARED TO 2ND GEN CRYOBALLOON

KEY TAKEAWAY

Use of the **THERMOCOOL SMARTTOUCH® Catheter** for ablation of PAF resulted in a substantial reduction in one-year expected hospital visit costs for index and repeat ablations compared to **THERMOCOOL® SF Catheter** or **the Arctic Front Advance™ Cardiac Ablation Catheter.**

REFERENCES

1. Osorio, Jose, et al. "Gains in Paroxysmal Atrial Fibrillation Ablation Using a Standardized Workflow to Optimize Contact Force Technologies." JAFIB: Journal of Atrial Fibrillation 11.4 (2018). **2.** Hunter TD, Palli SR, Rizzo JA. Cost comparison of radiofrequency catheter ablation versus cryoablation for atrial fibrillation in hospitals using both technologies. J Med Econ 19(10), 959-964 (2016).