

PCV26: A Comparison of the Costs of Atrial Fibrillation Using Radiofrequency Contact Force and Cryoballoon Technologies in the United States: An Analysis of Propensity Score Matched Populations

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Introduction

Atrial fibrillation (AFib) is a highly prevalent cardiac arrhythmia with considerable clinical and economic burden. Over 5.5 million people suffer from AFib in the US and this is expected to increase 30% by 2035¹. Current treatment options for AFib include drug therapy and catheter ablation, of which radiofrequency (RF) contact force (CF) ablation and cryoballoon (CB) ablation are the two most commonly used technologies.

Objective

This analysis aimed to compare the one-year total costs of AFib ablation using a CF catheter against that using a CB catheter when used alone or with RF ablation.

Methods

- A model was built using an electronic spreadsheet to calculate the difference in total annual treatment cost between CF and CB alone, and CF and CB with RF ablation.
- Clinical and cost inputs for index procedure and 4-12-month readmissions were based on the results of a propensity score analysis of the Premier Healthcare database² (Table 1). Costs were reported in 2017 US dollars.
- Scenario analyses for 50, 150, and 350 procedures per year were conducted to consider low-, medium-, and high-volume centers.

Table 1. Clinical and economic parameters and input values

PARAMETER	CF vs. CB Alone		CF vs. CB & RF	
	CF	CB	CF	CB & RF
INDEX ABLATION PROCEDURE				
% Inpatient	14.02%	12.88%	14.21%	14.98%
% Outpatient	85.98%	87.12%	85.79%	85.02%
INDEX ABLATION PROCEDURE COST				
Inpatient Total	\$26,063	\$26,279	\$25,436	\$28,142
Inpatient Supply	\$9,816	\$10,907	\$9,536	\$12,316
Inpatient Room & Board	\$4,148.43	\$3,650.10	\$4,142.42	\$3,870.55
Outpatient Total	\$22,223	\$24,064	\$22,435	\$24,736
Outpatient Supply	\$10,200	\$11,624	\$10,305	\$12,308
4-12-MONTH READMISSION RATE				
All-cause Readmission Rate	6.15%	12.01%	6.57%	9.21%
CV-related Readmission Rate	4.47%	6.70%	4.72%	5.84%
AFib-related Readmission Rate	2.51%	4.47%	2.47%	3.60%
4-12-MONTH READMISSION COST				
All-cause		\$17,513.88		
CV-related		\$17,531.65		
AFib-related		\$17,276.14		

Results

Cost savings with CF were observed for the index procedure, 4-12-month readmissions, and total annual treatment when compared to CB alone and compared to CB with RF.

Index procedure (Figure 1)

- Savings in supply costs accounted for 87% of index-procedure cost savings with CF when compared to CB alone and 89% when compared to CB with RF.

4-12-month Readmissions (Figure 2)

- Savings in AFib-related readmission costs accounted for 33% of 4-12-month readmission cost savings with CF when compared to CB alone and 42% when compared to CB with RF.

Total Annual Treatment (Figure 3)

- Potential annual cost savings with CF compared to CB alone ranged from \$130,712 when 50 ablations were performed to \$914,983 when 350 ablations were performed. Savings were 9% greater for CF when compared to CB with RF.
- Savings in index-procedure costs accounted for 61% of the total annual cost savings with CF when compared to CB alone and 84% when compared to CB with RF.

Sensitivity Analyses (Figure 4)

- In both treatment comparisons, the model was most sensitive to the outpatient index-procedure costs and inpatient index-procedure costs of CB and CF.

Results

Figure 1. Potential Cost Savings In Index Procedures with CF

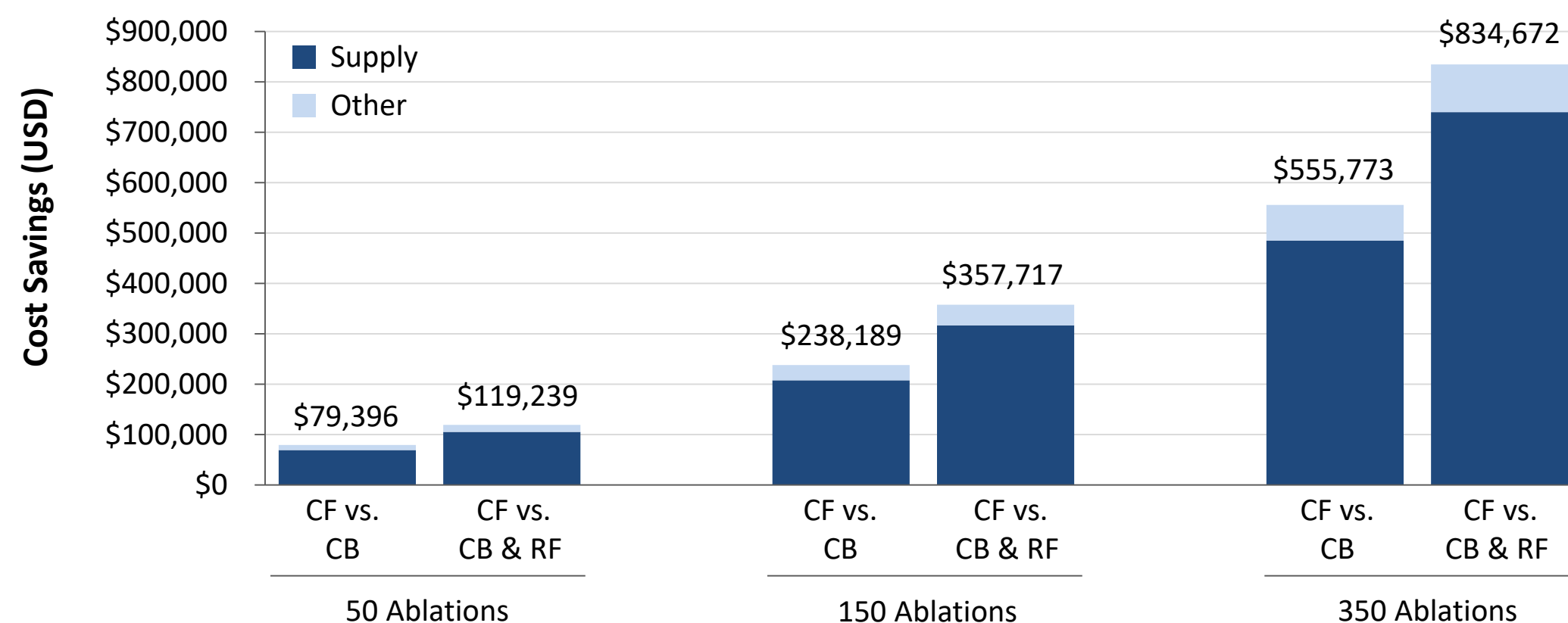


Figure 2. Potential Cost Savings In 4-12-Month Readmissions with CF

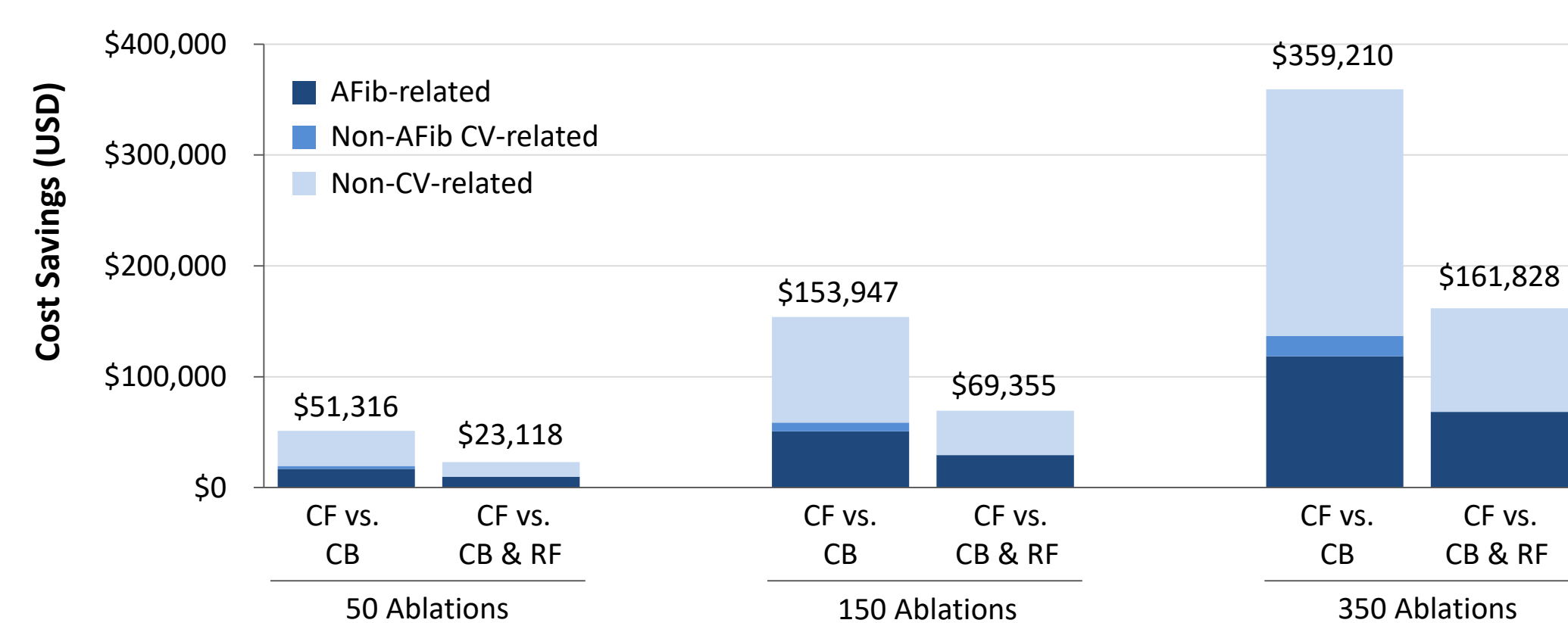


Figure 3. Potential Cost Savings In Annual Treatment with CF

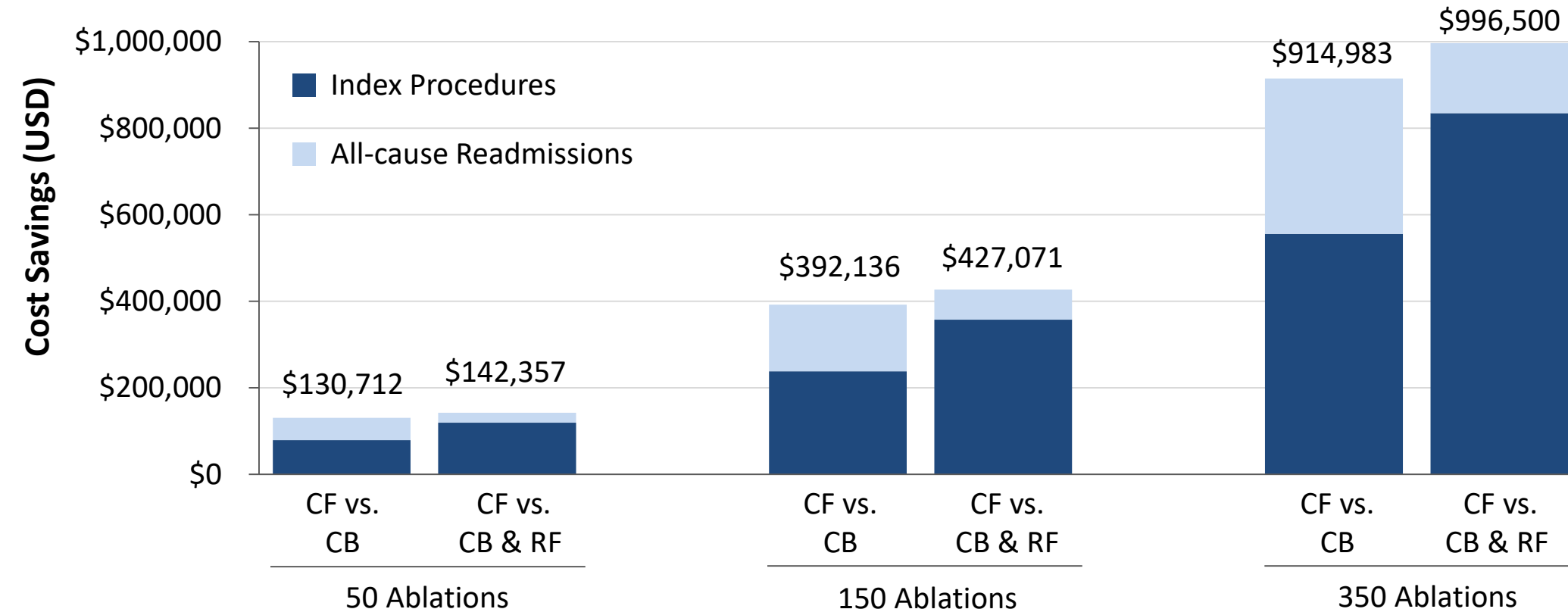
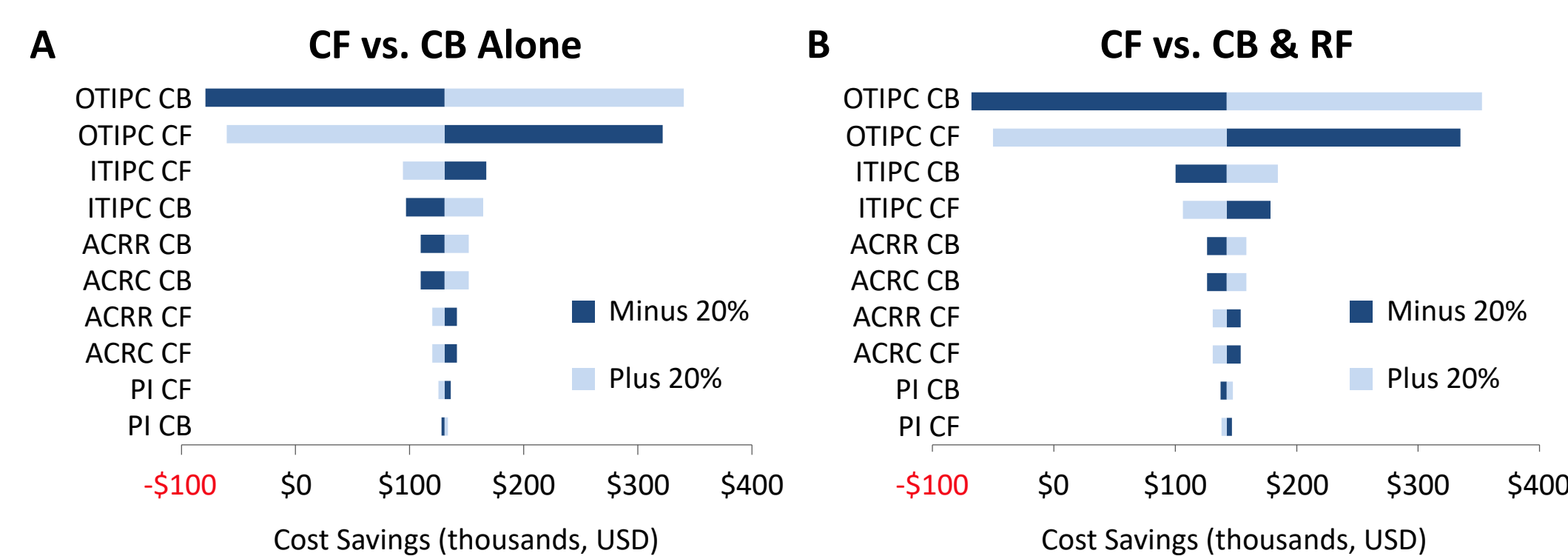


Figure 4. Results of One-way Sensitivity Analyses



Abbreviations: ACRC = all-cause readmission cost, ACRR = all-cause readmission rate, CB = cryoballoon, CF = contact force, ITIPC = inpatient total index-procedure cost, OTIPC = outpatient total index-procedure cost, PI = percentage inpatient, RF = radiofrequency, USD = US dollars.

Conclusion

Potential annual treatment costs of AFib catheter ablation were substantially lower with CF compared to both CB alone and CB with RF ablation. Ablation using CF led to cost savings in both index procedures and 4-12-month readmissions.

References: 1. Khavjou et al. (2016) Projections of cardiovascular disease prevalence and costs: 2016-2035. *American Heart Association Technical Report*. 2. Pollak et al. (2018). Economic impact of atrial fibrillation ablation with radiofrequency contact force catheter versus cryoballoon catheter. *J Comp Eff Res*. 8(4): 251-264.