Variations in Healthcare Resource Use and Expenditures by Age in Patients under Age 65 Newly Diagnosed with Paroxysmal Supraventricular Tachycardia (PSVT) in the United States

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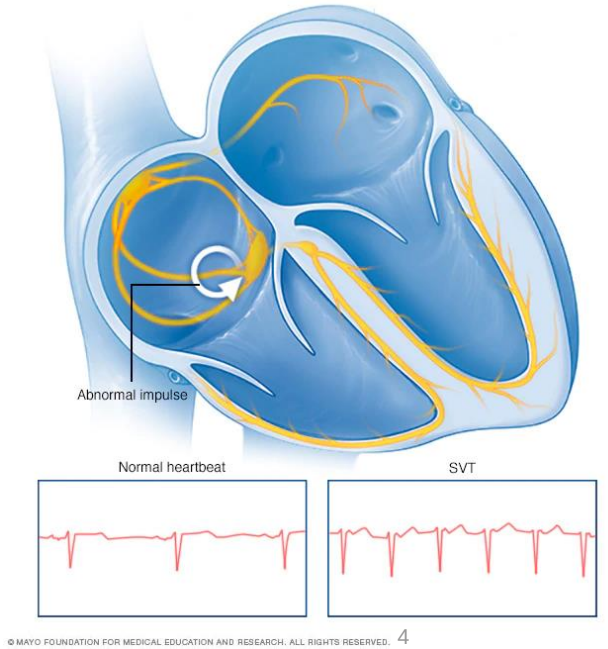
Background

Background: PSVT

What is PSVT?

Paroxysmal supraventricular tachycardia (PSVT) is a sporadic, sudden and recurring tachycardia due to abnormal electrical pathways present in the heart at birth.



- Due to its episodic nature, PSVT can be difficult to diagnose. Consequently, patients may initially be diagnosed with other cardiac rhythm disorders.[1,2]
- Medical treatment options are limited; acute episodes are treated with IV adenosine, other IV beta-blockers, or calcium channel blockers in an ED setting. Chronic management consists of surveillance and prophylactic treatment with beta-blockers, calcium channel blockers or antiarrhythmic drugs. Patients may also be treated with catheter ablation, which is considered curative.[2]

What is known about HRU & costs for PSVT patients?

- Little is known about healthcare resource use or costs before and after PSVT diagnosis.
- Epidemiologic studies of PSVT have found that PSVT prevalence increases with age and that more females than males are diagnosed with PSVT, but outcomes of newly diagnosed PSVT patients, including the impact of diagnosis on expenditures, have not been studied.[1,3]
- Catheter ablation is considered curative for PSVT; however, the costs associated with this procedure for PSVT patients are not known.

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Objectives & Methods

Study Objective

Retrospective Employer-Based Claims Data Analysis

Objective	Characterize variations in downstream healthcare costs and catheter ablations in patients age <65 (<18y, 18-40y, 41-64y) newly diagnosed with PSVT.
Aims	1) Compare variations in healthcare costs by age group 3 years pre- and post-PSVT diagnosis 2) Characterize catheter ablations in the year following PSVT diagnosis

Health insurance claims from commercial payers (age < 65) were used to estimate the impact of PSVT on healthcare costs and catheter ablations.

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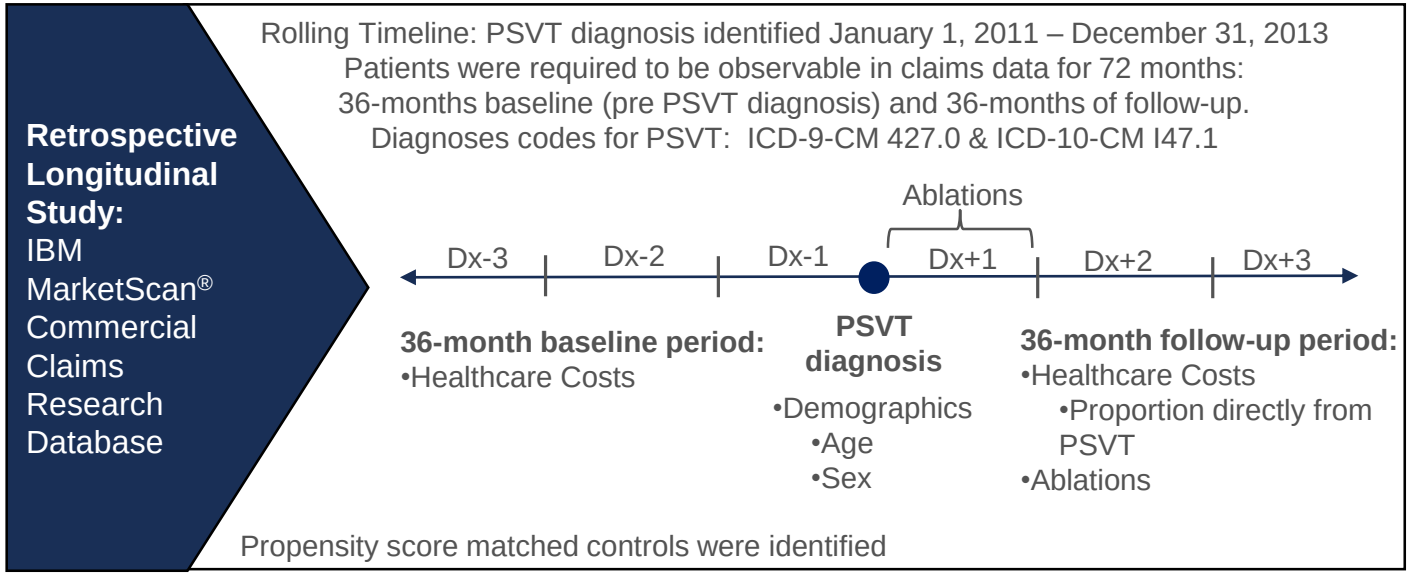
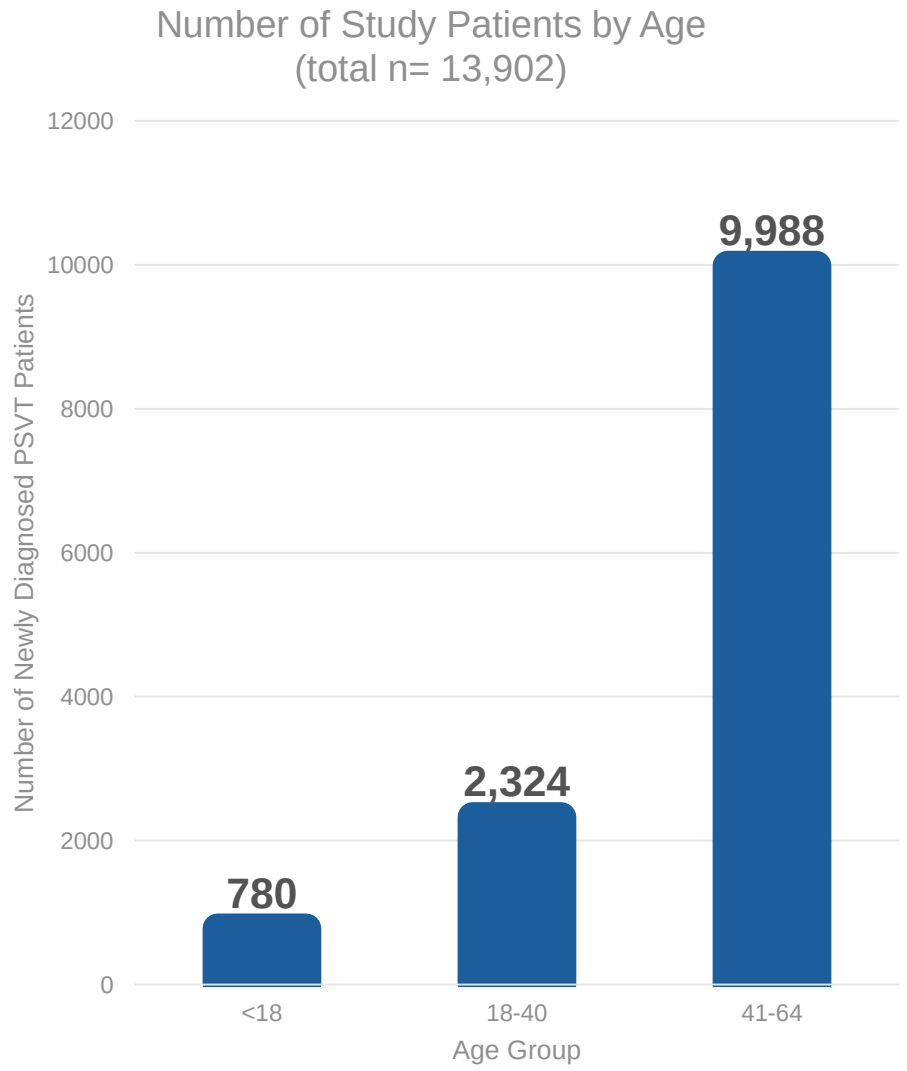
Methods

Data Source	IBM MarketScan® Commercial research database with demographic, enrollment and medical claims data
Study Population	Patients newly diagnosed with PSVT (ICD-9: 427.0; ICD-10: I47.1) and observable for three years before and after index diagnosis
Study Years	January 1, 2008 – December 31, 2016
Outcome Measures	HRU and costs paid by insurers 3 years pre- and post-PSVT diagnosis relative to matched controls Proportion of patients treated with catheter ablations one year post-PSVT diagnosis



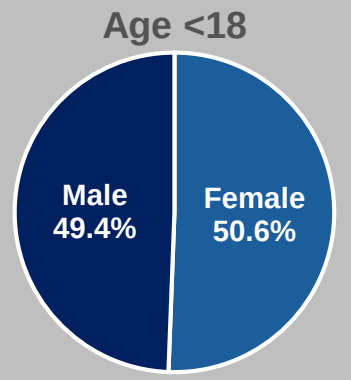
Results

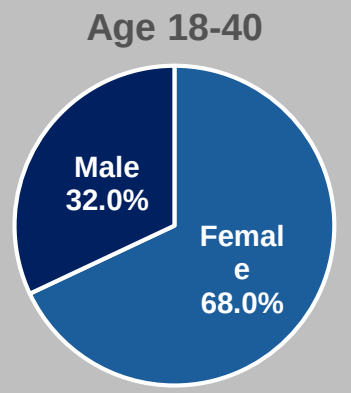
Demographic Characteristics of patients with PSVT

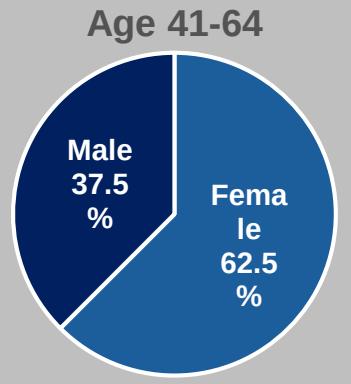


- 13,092 patients newly diagnosed with PSVT
- Majority were age 41-64 (72.3%)
- More females than males across all age groups
- Matched controls (n=13,092) were not significantly different than patients with PSVT on any characteristics (age, sex, geographic region, comorbid conditions)

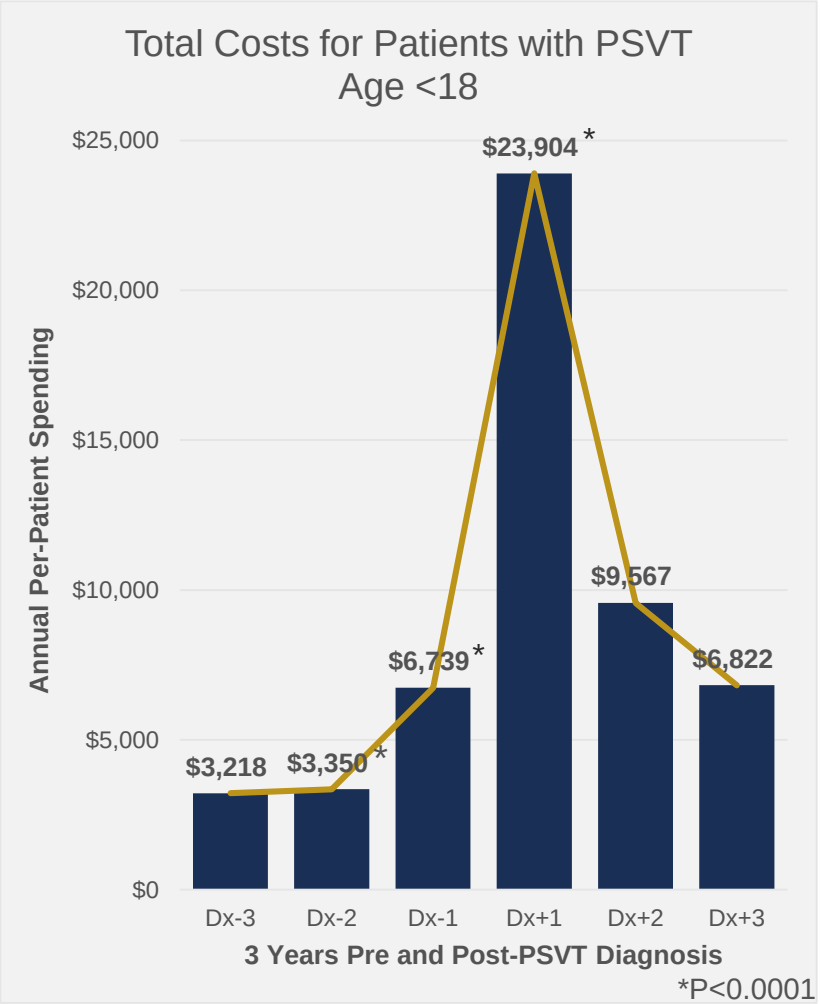
Sex: Female vs Male

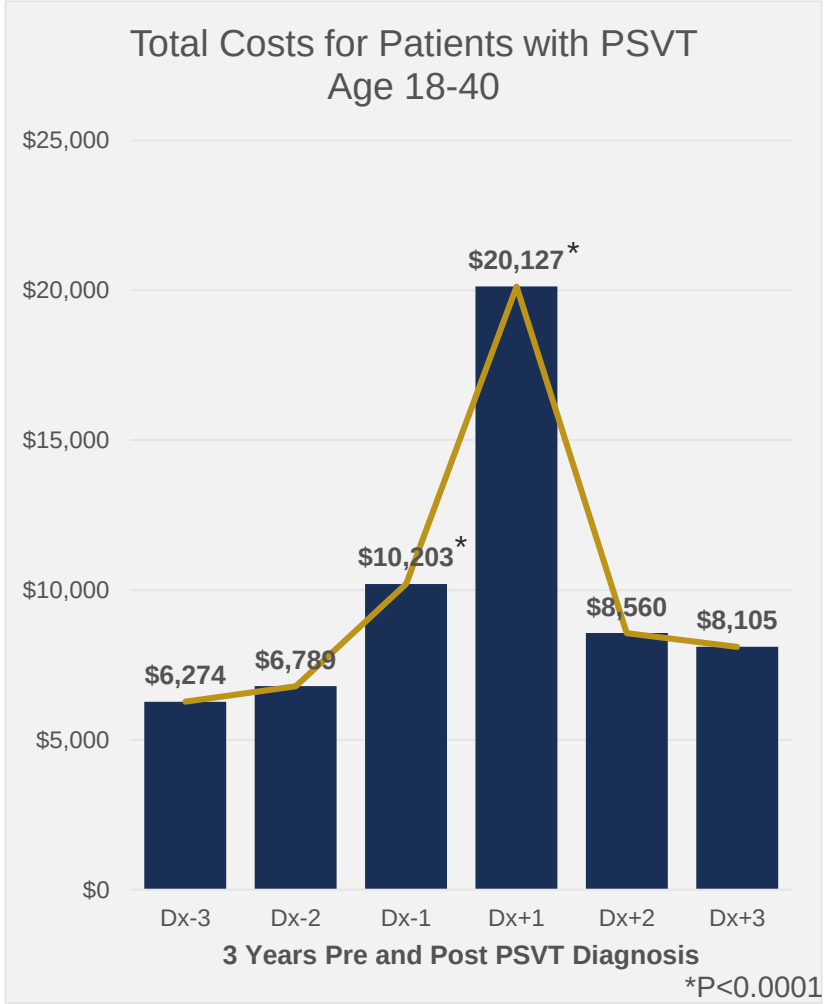


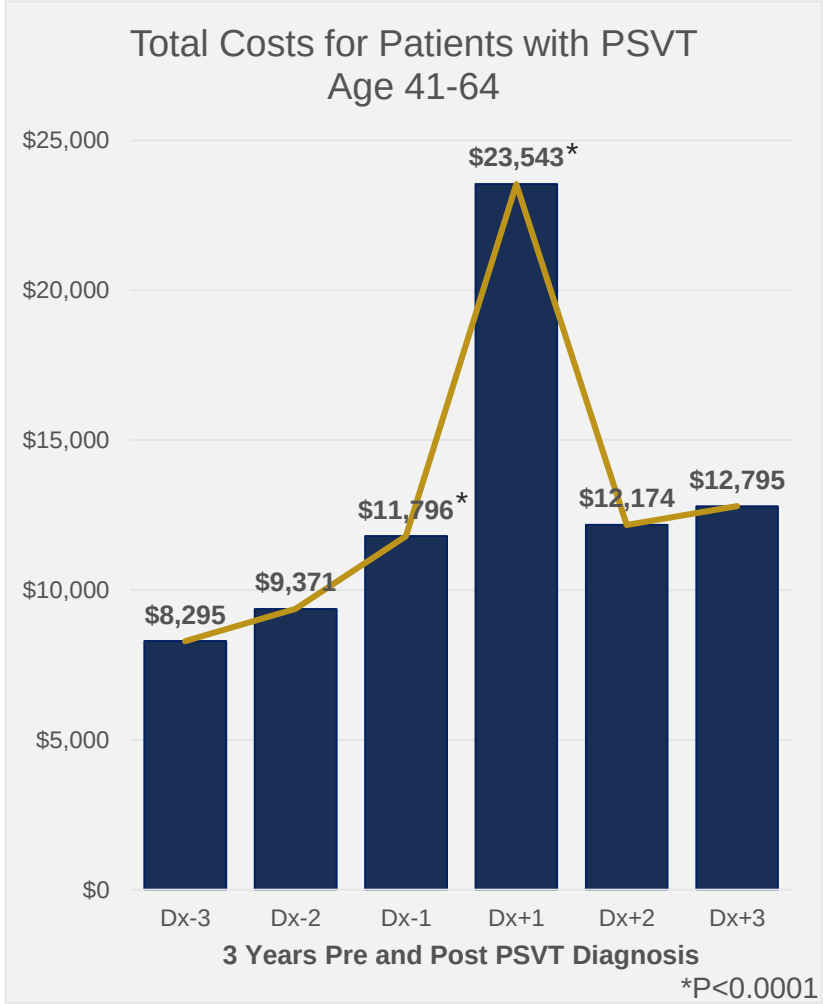




Costs Before and After PSVT Diagnosis







- Costs in all age groups were relatively stable in the 13-36 months before index but rose significantly in the year immediately preceding diagnosis (P<0.0001).
- Costs decreased in the second and third years following PSVT diagnosis, but did not return to pre-PSVT diagnosis levels.

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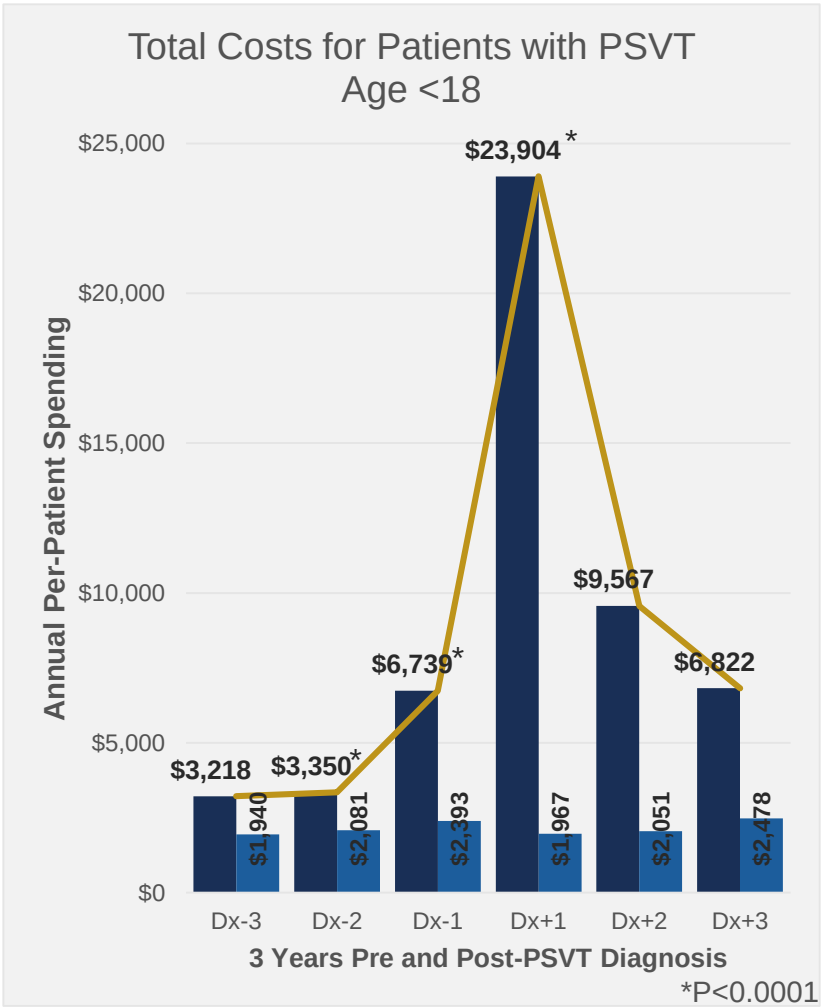
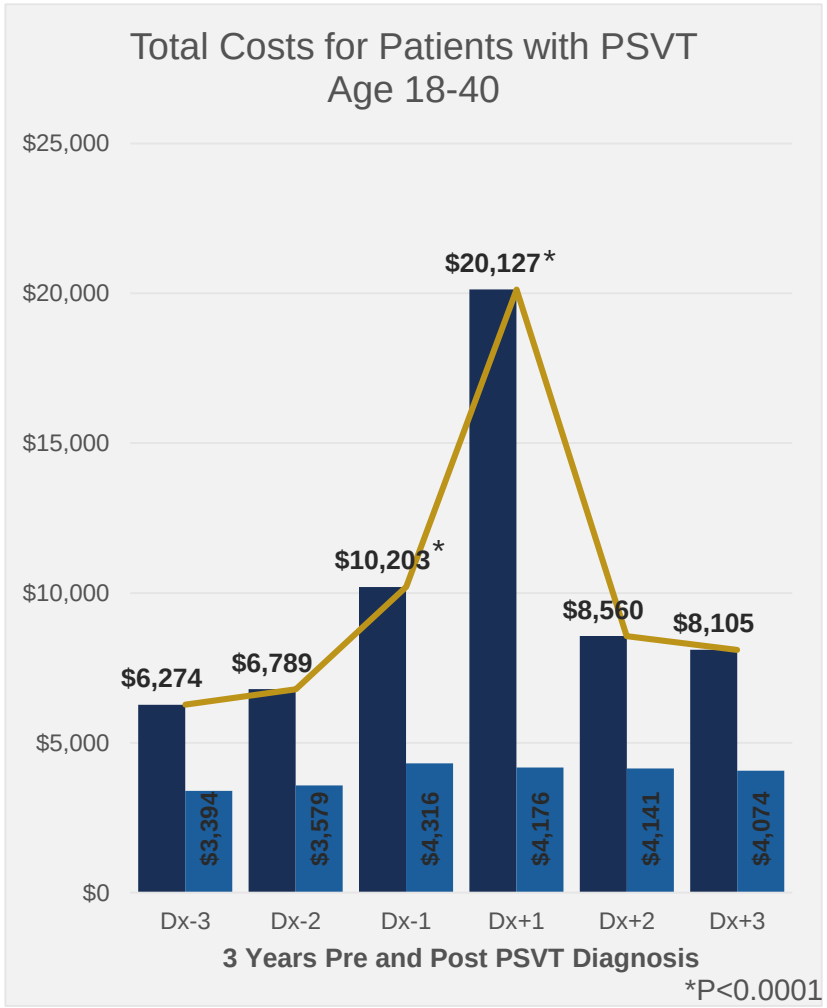
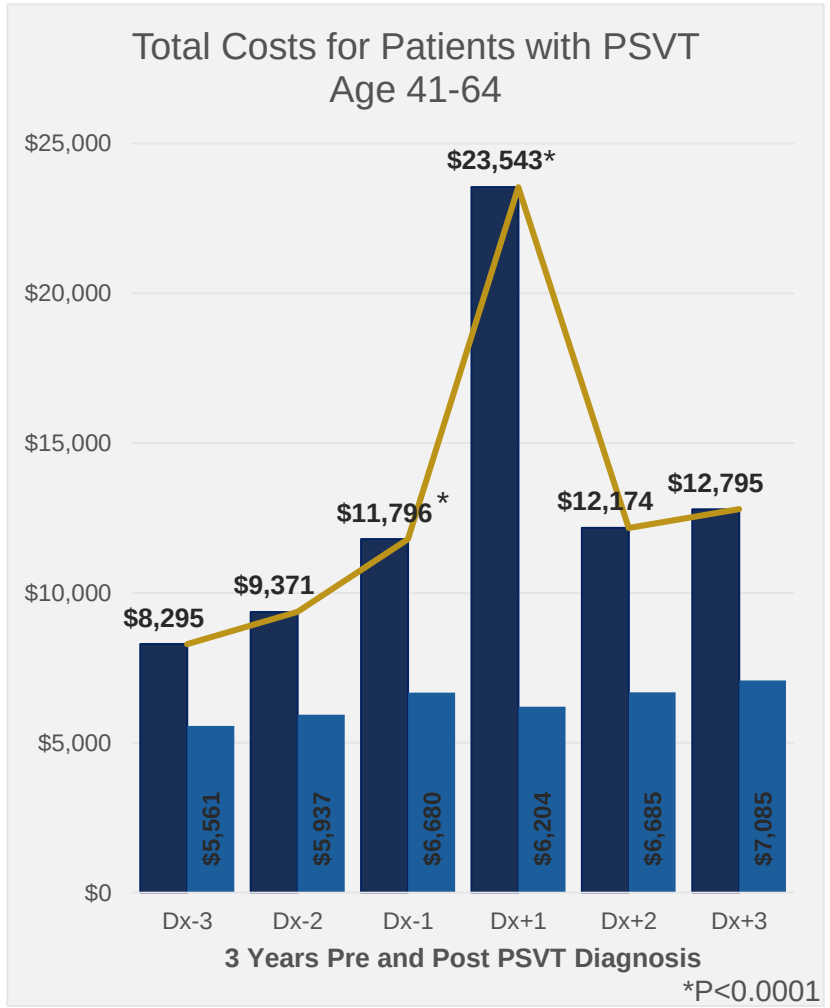
Costs Before and After PSVT Diagnosis Compared to Matched Controls







- Matched control patients in all age groups had significantly lower costs throughout the study period (P<0.0001).
- Costs for matched control patients showed minimal variation throughout the six year study period.

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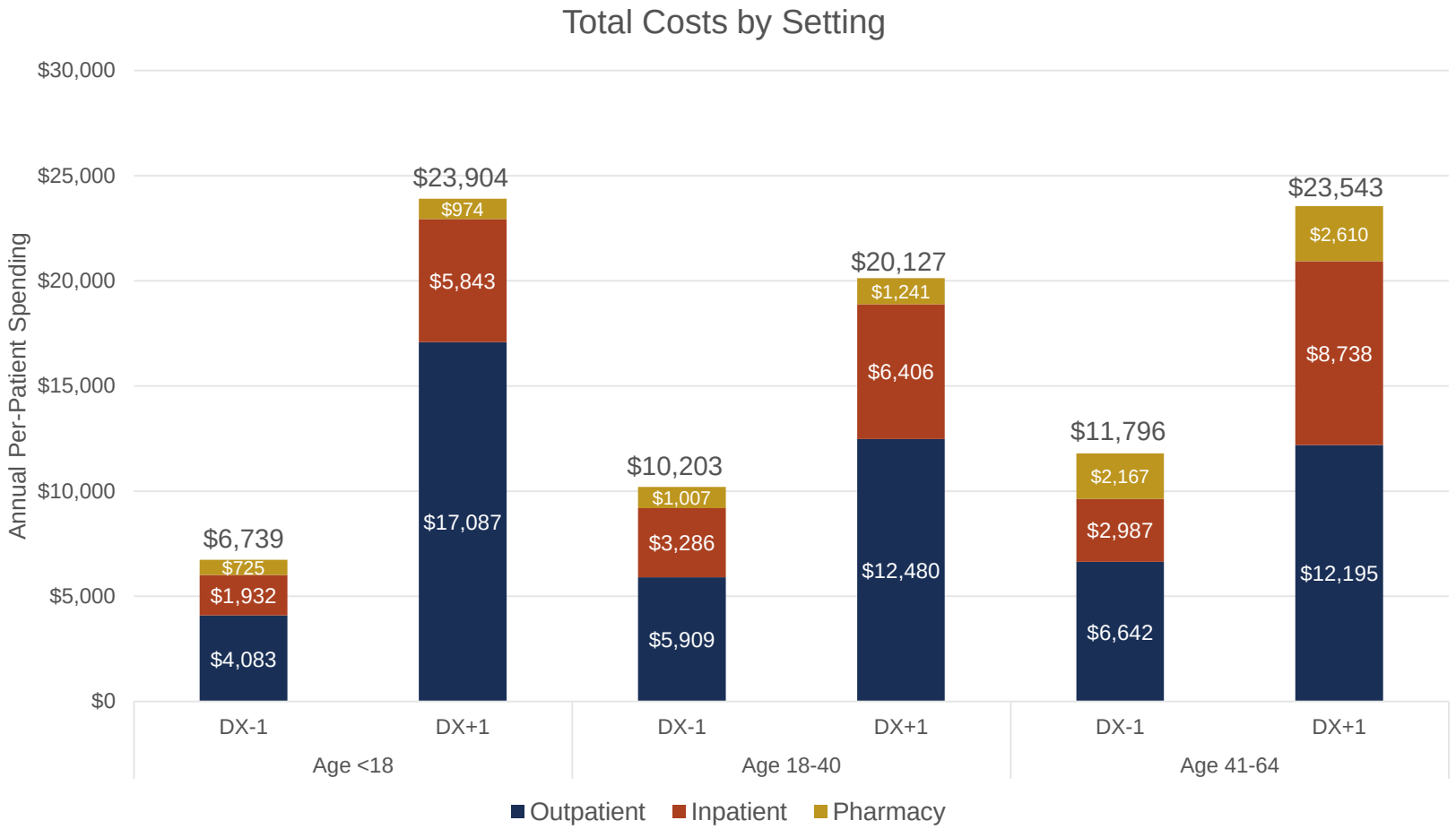
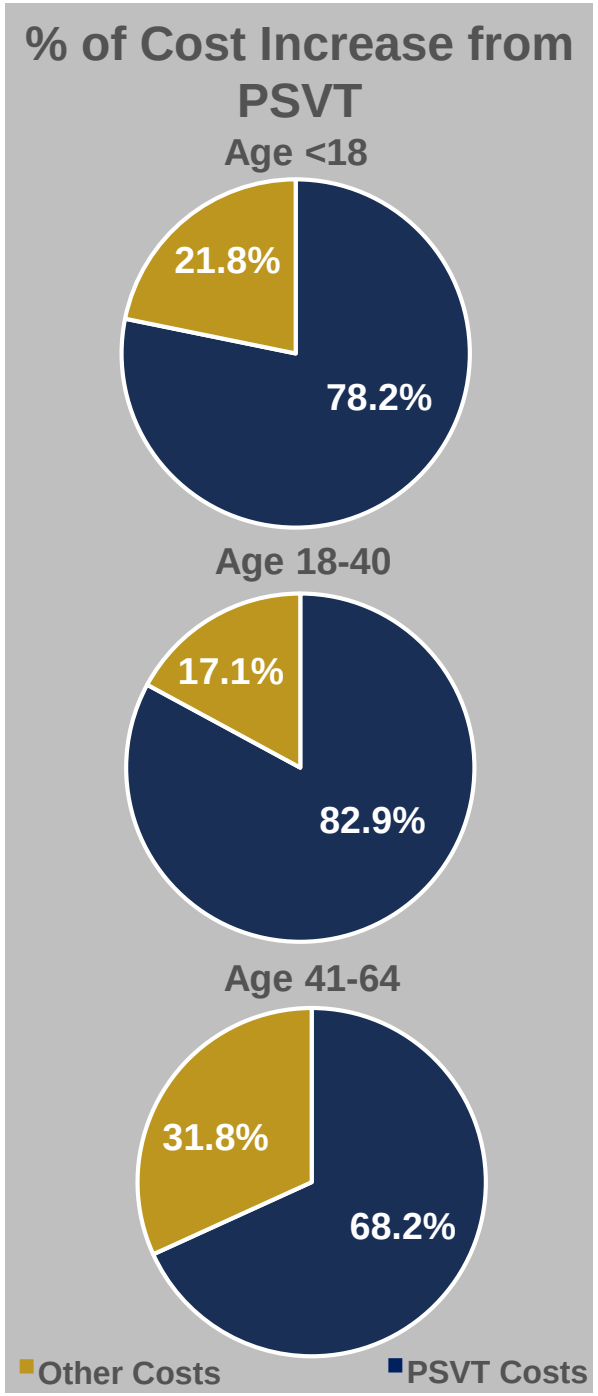
Costs of PSVT by Setting





- Drivers of costs were inpatient and outpatient services; pharmacy spend was not a main driver of costs across age groups.
- Costs for healthcare encounters with PSVT diagnoses accounted for more than two-thirds of these cost increases in all age groups.

Costs of Healthcare Encounters for Patients with PSVT

Average Cost per Healthcare Encounter in the Year Following PSVT Diagnosis			
	Age <18	**Age 18-40**	**Age 41-64**
Cost per Inpatient Admission	$34,371	$22,877	$30,133
Cost per ED Visit	$849	$982	$1,095
Cost per Outpatient Hospital Visit	$4,023	$2,352	$1,736
Cost per Office Visit	$170	$163	$173

- In the year following PSVT diagnosis, cost per Inpatient Admission ranged from $22,877 to $34,371, cost per ED visit ranged from $849 to $1,095, cost per outpatient hospital visit ranged from $1,736 to $4,023, while cost per office visit ranged from $163 to $173.
- Inpatient admission and outpatient hospital visit costs were highest for patients age <18; cost per ED visit was highest for patients age 41-64.
- Cost per office visit remained similar across all age groups.

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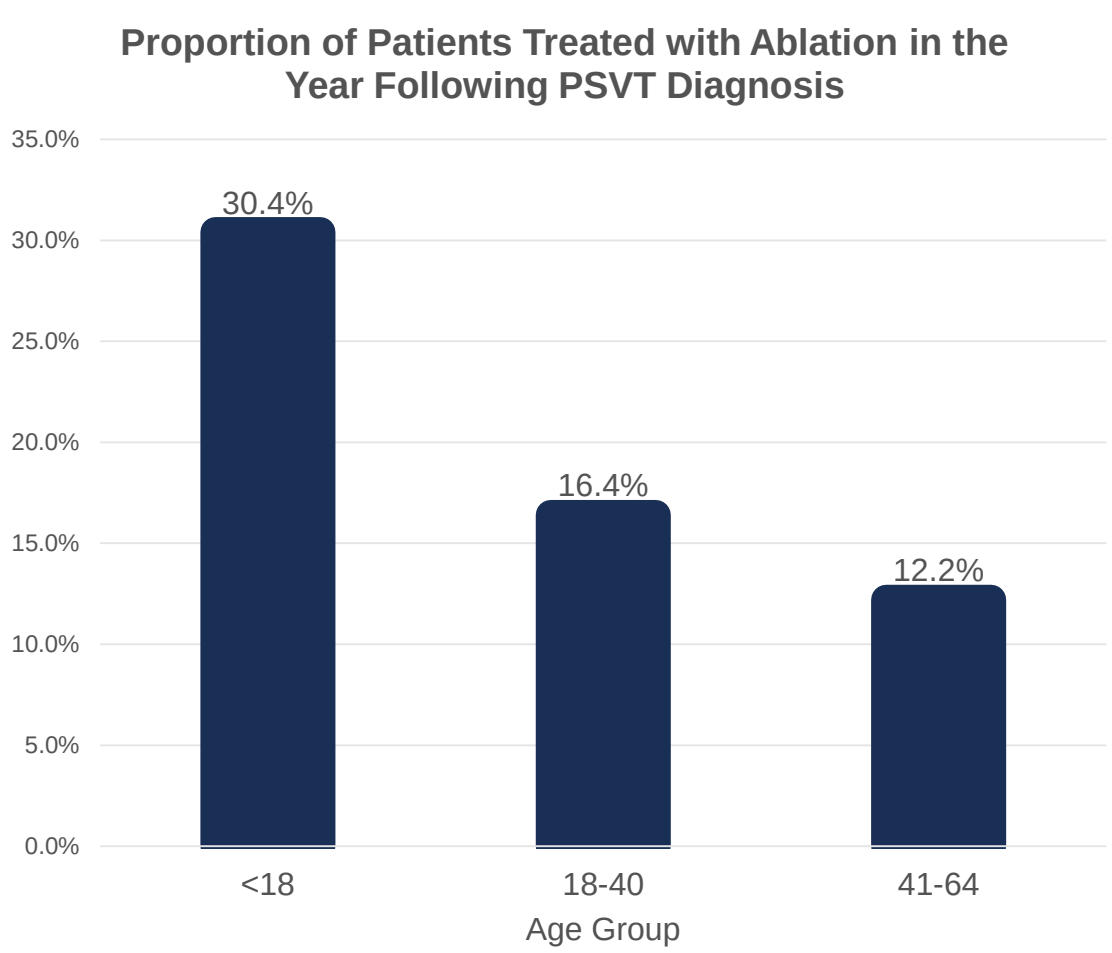
Ablations



Cost of Ablation by Setting			
	<18	18-40	41-64
Any Setting	$40,656	$32,212	$30,424
Inpatient	$59,923	$41,674	$51,399
Outpatient Hospital	$37,940	$30,124	$26,004

- The proportion of patients treated with ablation in the year following PSVT diagnosis was highest in younger patients and significantly decreased with age (P<0.0001).
- The average cost of ablation ranged from $30,424 to $40,656.
- Cost for an inpatient ablation was higher than outpatient hospital ablation in all age groups.
- Ablations accounted for 34% of the cost increase in patients age 41y to 64y (vs. 18y-40y: 57% vs. < 18y: 34%)

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Study Limitations, Summary and Conclusions

Study Limitations

Study relied on claims data

- Laboratory, diagnostic and other test results not included in claims data

Study patients limited to those under age 65

- Results may not be generalizable to older patients (age 65 and above)

Costs reported reflect amounts paid by insurers to providers

- Patient co-payments and indirect costs not reflected in these estimates

Conclusion

- Healthcare costs increased in the year following PSVT diagnosis across all ages, consistent with the challenges in making a PSVT diagnosis.
  - These increases reflected costs of monitoring, ablation procedures, and medical management for PSVT
  - Healthcare encounters with a PSVT diagnosis accounted for 78%, 83% and 68% of the increase for patients age < 18y, 18-40y and 41-64y, respectively
  - These cost increases were not evident in propensity score matched controls
- Costs for patients with PSVT increased in the year before diagnosis, potentially reflecting healthcare encounters for undiagnosed PSVT
  - Costs for PSVT patients compared with controls were also higher in the 2nd and 3rd years before PSVT diagnosis, potentially suggesting undiagnosed PSVT
- Costs decreased in the two years following diagnosis, although they do not return to pre-PSVT diagnosis levels
- Ablation rates declined significantly with increasing age
  - Ablations contributed to cost increases but did not drive them

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Questions?