

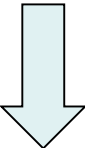
# Healthcare Resource Use and Expenditures in Patients under 65 Years of Age and Newly Diagnosed with Paroxysmal Supraventricular Tachycardia (PSVT) in the United States

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## Disclosures

This study was funded by Milestone Pharmaceuticals. Dr. Sacks, Mr. Cyr, Mr. Sharma and Ms. Green are employees of Precision Xtract. Dr. Douville is an employee of Milestone Pharmaceuticals. Ms. Bariahtaris received consulting fees from Milestone Pharmaceuticals for this project. Milestone Pharmaceuticals is conducting clinical studies in PSVT, but has no products that are approved for treatment of PSVT.

# Paroxysmal Supraventricular Tachycardia (PSVT): Episodic, recurring medical condition

|                               |  |   |
|-------------------------------|--|---|
| <b>Indication</b>             | <b>Paroxysmal Supraventricular Tachycardia (PSVT)</b> <ul style="list-style-type: none"> <li>• <b>Sporadic, sudden and recurring tachycardia</b> due to altered electrical conductivity over the atrioventricular node of the heart</li> </ul>   |   |
| <b>Diagnosis</b>              | <ul style="list-style-type: none"> <li>• <b>Can only be diagnosed <u>during an acute episode</u></b> on a rhythm strip (e.g., ECG / Holter monitor)</li> <li>• Due to transient and episodic nature, it is a <b>difficult condition to diagnose</b></li> <li>• Market dynamic - growth of wearable devices/monitors present an opportunity for easier diagnosis</li> </ul> |   |
| <b>Therapeutic Approaches</b> | <b>Acute Treatment</b><br><i>(treating an attack)</i><br><u>At Home</u> : No Rx options, Vagal maneuver<br><u>Emergency Room</u> : IV adenosine, Vagal maneuver  | <b>Chronic Management Strategies</b><br>Surveillance / “Watchful waiting”<br><u>Rx</u> : Beta blockers (primarily)<br><u>Surgical</u> : Catheter ablation <div style="float: right; text-align: center;"> <p>Severity (in general)</p>  <p>Mild<br/>Moderate<br/>Severe</p> </div> |
| <b>Cost of Care</b>           | <ul style="list-style-type: none"> <li>• PSVT may be associated with healthcare resource use and costs due to the recurrent nature of this tachycardia</li> <li>• Cardiac ablations may also contribute to economic burden of PSVT</li> <li>• Information on healthcare resource use and costs of PSVT patients is not known</li> </ul>                                    |   |

# Study Objectives

## Employer-Based Claims Data Analysis

### Objective

Characterize healthcare resource use (HRU) and spending in newly diagnosed Paroxysmal Supraventricular Tachycardia (PSVT) patients <65 years of age.

### Aims

- 1) Quantify health care resource in a longitudinal fashion
- 2) Quantify the cost to payer of PSVT

Health insurance claims were used to estimate the impact of PSVT on healthcare resource use (HRU) and costs

# Study Methodology

## Data Source

Truven Health MarketScan Commercial research database: demographic, enrollment, medical and prescription drug claims data for 89,800,000 nationally representative, commercially insured individuals over four years

## Study Population

Patients < age 65 newly diagnosed with PSVT (ICD-9: 427.0; ICD-10: I47.1) from October, 2012 to September, 2016, and observable for one year before and after index diagnosis

## Study Years

October 2012 – September 2016

## Outcome Measures

HRU and costs paid by insurers one year pre- and post-diagnosis  
HRU and costs for services for newly diagnosed PSVT relative to matched controls  
HRU and costs for ablations for newly diagnosed PSVT

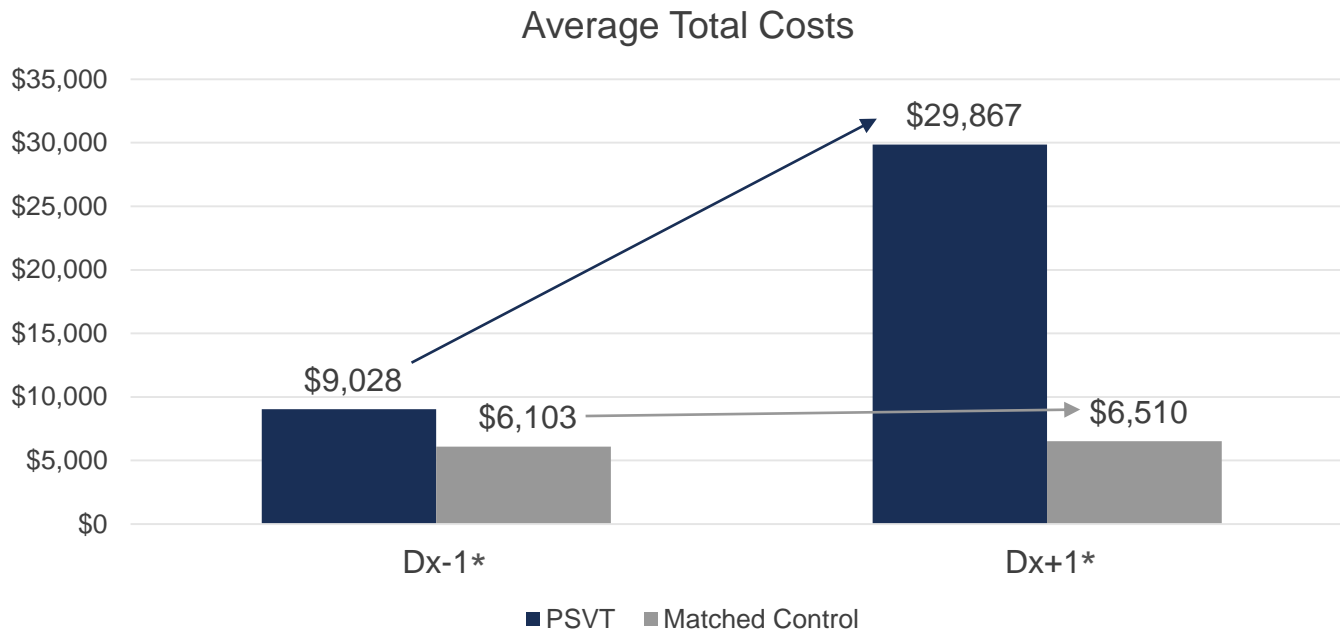
# Results

# Patient Clinical Characteristics

| Clinical Characteristics                          | PSVT w/ matched control | Matched control |
|---|-------------------------|-----------------|
| Number of Patients                                | 24,718                  | 24,718          |
| Female (%)  | 15433 (62.44%)          | 15470 (62.59%)  |
| Age   |                         |                 |
| Mean/SD   | 47.37 (14.37)           | 47.51 (14.44)   |
| Median  | 52                      | 52              |
| % < 18 years old                                  | 1267 (5.13%)            | 1295 (5.24%)    |
| % 18-40 years old                                 | 5112 (20.68%)           | 4982 (20.16%)   |
| % 41-64 years old                                 | 18339 (74.19%)          | 18441 (74.61%)  |
| Charlson Comorbidity Index (CCI)                  | 0.39 (0.92)             | 0.35 (0.86)     |
| Diabetes  | 2816 (11.39%)           | 2802 (11.34%)   |
| Congestive heart failure                          | 329 (1.33%)             | 315 (1.27%)     |
| Peripheral vascular disease                       | 445 (1.8%)              | 408 (1.65%)     |
| AMI   | 73 (0.3%)               | 76 (0.31%)      |
| Mitral valve prolapse                             | 430 (1.74%)             | 414 (1.67%)     |
| AFib  | 345 (1.4%)              | 355 (1.44%)     |
| Congenital cardiac defects                        | 39 (0.16%)              | 26 (0.11%)      |
| ASCVD (Peripheral artery disease + stroke or AMI) | 17 (0.07%)              | < 11            |
| Hypertension                                      | 7692 (31.12%)           | 7782 (31.48%)   |
| Cerebrovascular disease                           | 313 (1.27%)             | 312 (1.26%)     |
| Stroke  | 91 (0.37%)              | 81 (0.33%)      |
| TIA   | 95 (0.38%)              | 99 (0.4%)       |
| Carotid stenosis                                  | 174 (0.7%)              | 173 (0.7%)      |
| Chronic pulmonary disease                         | 2656 (10.75%)           | 2726 (11.03%)   |
| Chronic renal disease                             | 331 (1.34%)             | 307 (1.24%)     |
| Malignancy  | 1055 (4.27%)            | 1089 (4.41%)    |
| Anxiety/Panic Disorder                            | 2190 (8.86%)            | 2233 (9.03%)    |

\* masked = next lowest cell needed to be masked to protect identity of patients with cell counts < 11

# Spending Increases Post Diagnosis and Higher Spending for PSVT Patients Relative to Matched Controls

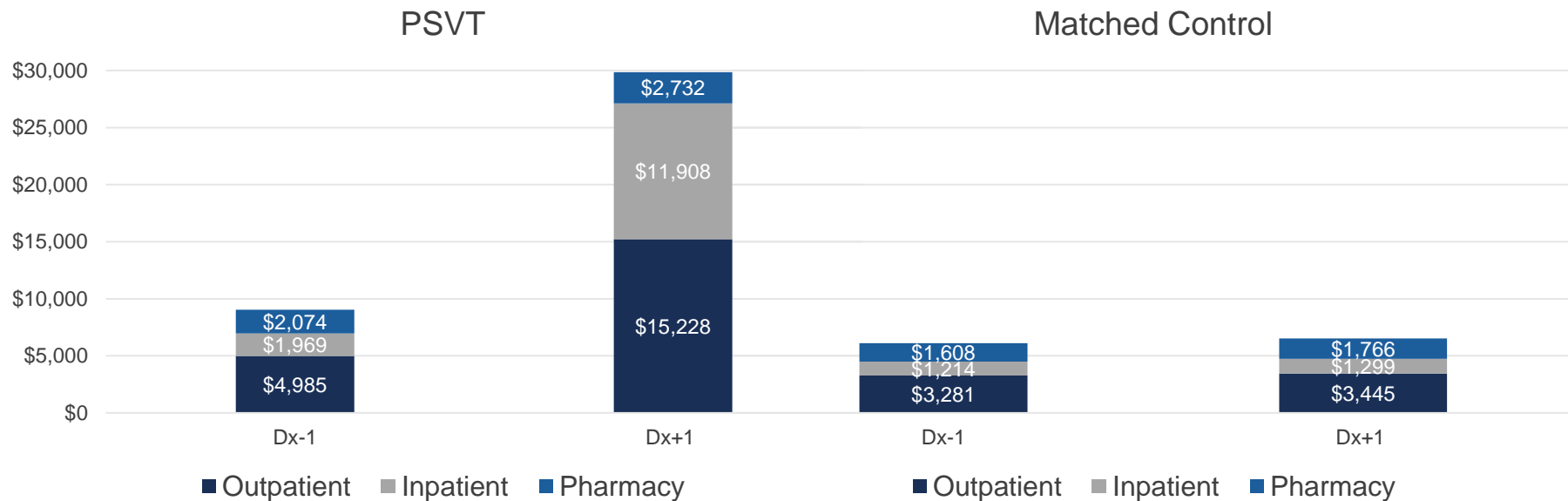


**In the year following diagnosis, total spending more than tripled for PSVT patients. By contrast, spending stayed relatively neutral over the 2 year study period for controls**

\* Dx-1 and Dx+1 refer to 12 months prior to and following diagnosis, respectively

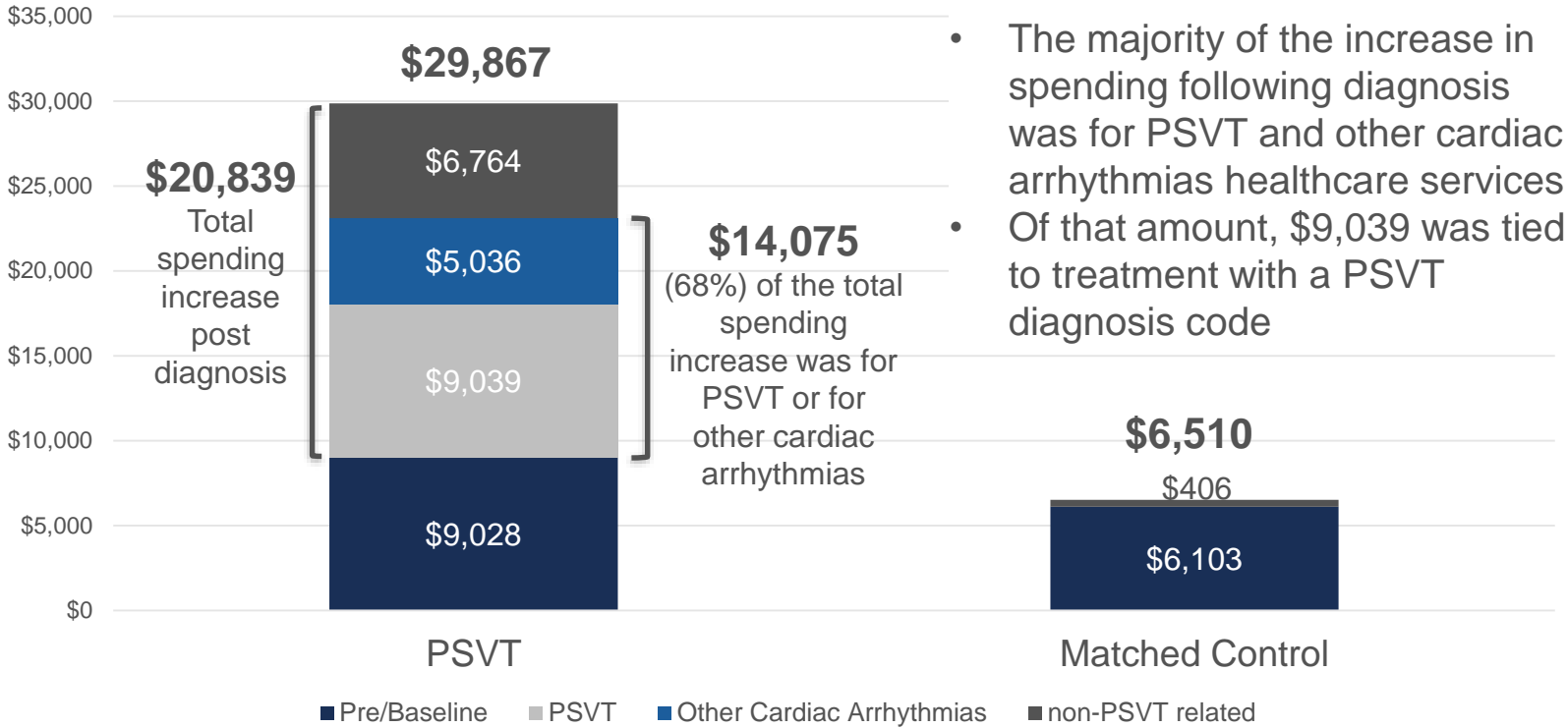


# Spending increases in year following PSVT diagnosis reflect large increases in outpatient and inpatient costs

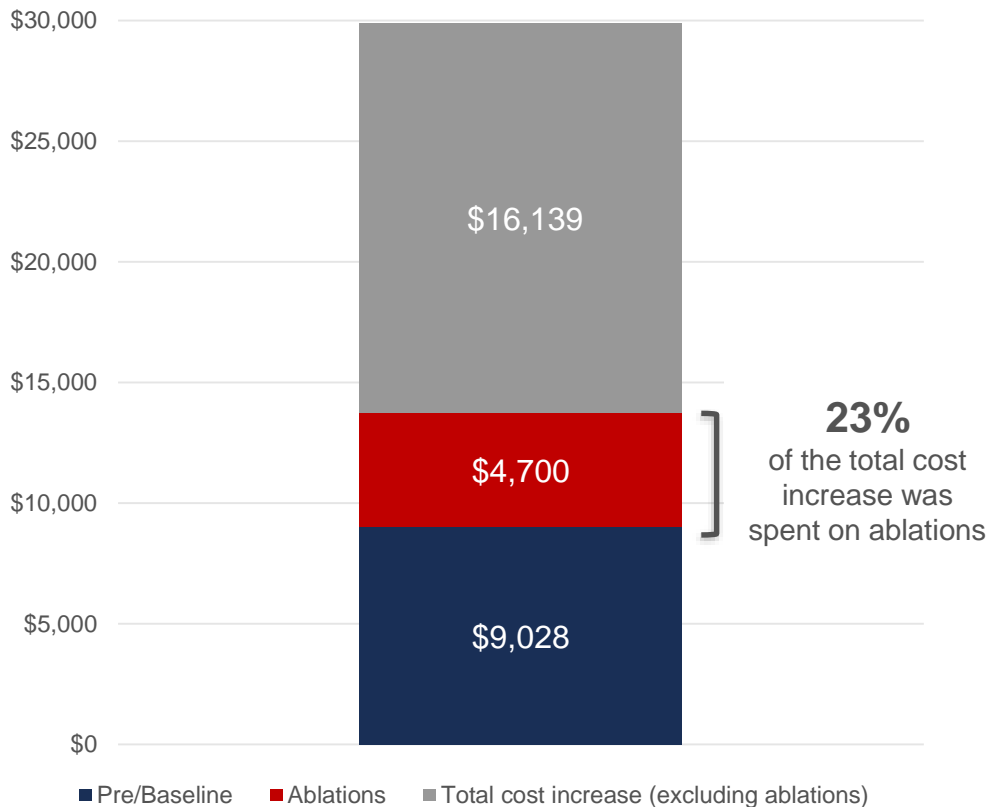


**In the year following diagnosis, inpatient and outpatient spending increased drastically for PSVT patients. By contrast, spending stayed relatively neutral over the 2 year study period for controls**

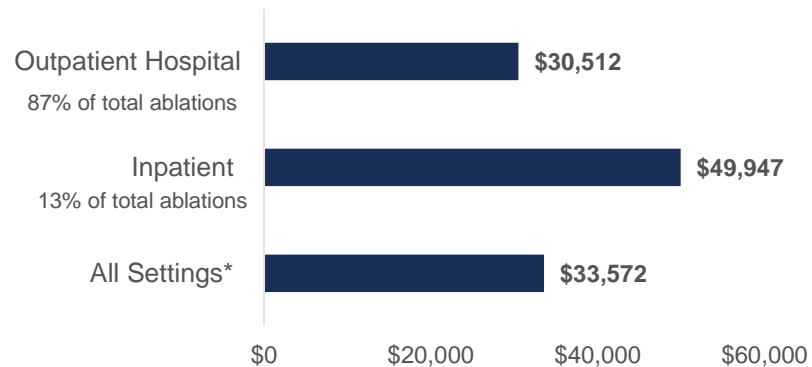
# Most of the increased spending in the year following diagnosis was for PSVT and other cardiac arrhythmias healthcare services



# Mean per patient cost for ablations were \$4,700 with costs per ablation ranging from \$30K to \$50K



## Mean Cost per ablation

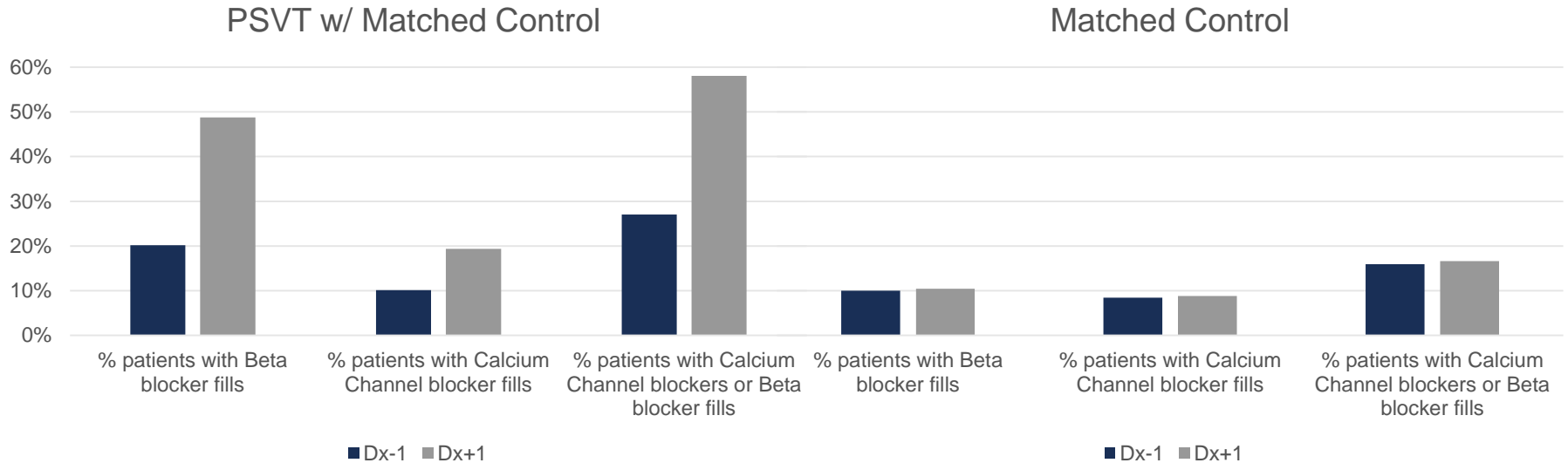


## Ablation Rates by setting

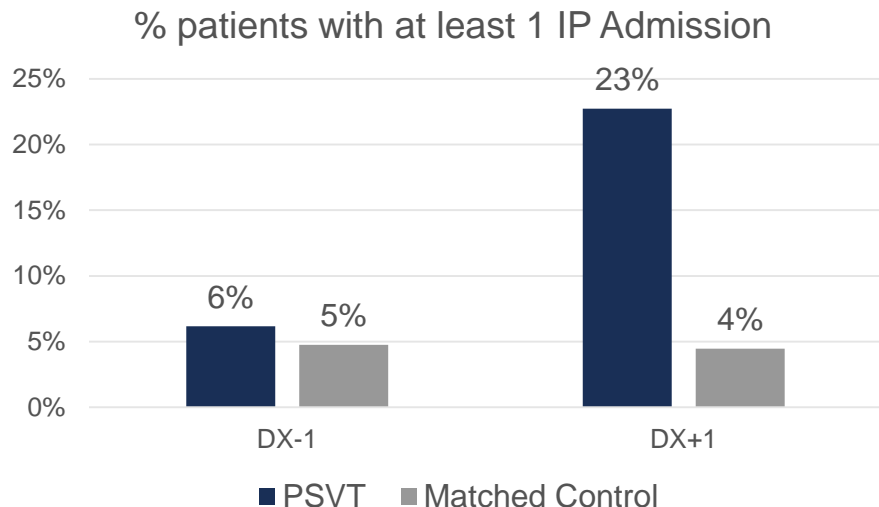
|                     |      |
|---------------------|------|
| All settings*       | 0.14 |
| Outpatient Hospital | 0.12 |
| Inpatient           | 0.02 |

\* Includes ablations in unspecified outpatient settings

# Prophylactic use pre- and post-diagnosis



# Hospitalization Rates and Costs

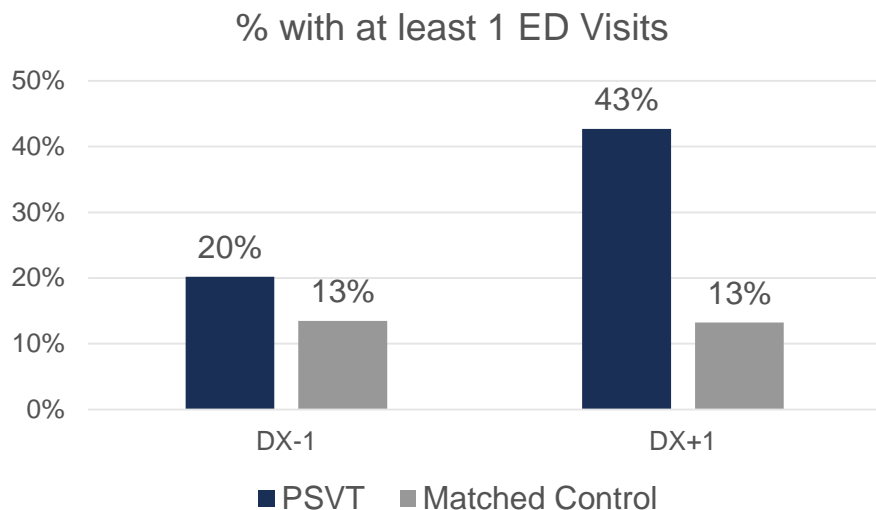


| IP Admission Rates      | Dx-1 | Dx+1 |
|-------------------------|------|------|
| PSVT w/ matched control | 0.08 | 0.35 |
| Matched control         | 0.06 | 0.06 |

| Cost per IP Admission   | Dx-1     | Dx+1     |
|-------------------------|----------|----------|
| PSVT w/ matched control | \$23,695 | \$33,816 |
| Matched control         | \$21,780 | \$23,588 |

**Following diagnosis, the percent of patients with ED visits and hospitalizations increased for PSVT patients. By contrast, these rates stayed stable for controls over the 2 year study period**

# Emergency Department Visit Rates and Costs



| ED Visit Rates (per patient) | Dx-1 | Dx+1 |
|------------------------------|------|------|
| PSVT w/ matched control      | 0.32 | 0.77 |
| Matched control              | 0.19 | 0.19 |

| Cost per ED Visit       | Dx-1  | Dx+1    |
|-------------------------|-------|---------|
| PSVT w/ matched control | \$936 | \$1,188 |
| Matched control         | \$890 | \$912   |

**Following diagnosis, the percent of patients with ED visits more than doubled for PSVT patients. By contrast, these rates stayed stable for controls over the 2 year study period**

# Study Limitations

Study relied on claims data

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

Two-year study window

- Patients may have had diagnoses of PSVT more than one year before the index diagnosis

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

## Summary and Discussion

Spending increases substantially following diagnosis of PSVT in commercially insured patients

- More than 2/3 of the increased spending is for services related to PSVT and other cardiac rhythm disorders

Spending increases are evident for both outpatient and inpatient services

- Emergency Department visits are high in the year prior to diagnosis, potentially reflecting difficulties with diagnosis
- ED visits and hospitalizations both increase in the year following diagnosis

Current treatment approaches for PSVT are associated with a large burden on providers and have a high economic burden for payers