Penumbra

CAVT™: A Health Economic Perspective in PE[1]

Objective

Retrospective analysis of resource use and health outcomes of **2,060** 1:1 propensity score matched patients with intermediate-risk pulmonary embolism (PE) when treated with:

- computer assisted vacuum thrombectomy (CAVT) with Lightning® 12 and Lightning Flash® 1.0 compared to
- anticoagulation (AC)
- catheter-directed thrombolysis (CDL)
- or other mechanical thrombectomy (Other MT) in the United States

Relative to Other Modalities Studied, CAVT is Associated with:

Lower composite complications[a]

3.4×

(statistically significant relative to other mechanical thrombectomy)

Shorter total hospital length of stay

25–35%

(statistically significant relative to all other modalities studied)

Higher rate of patients discharged to home

25–30%

(statistically significant relative to all other modalities studied)

75% By increasing the number of patients treated with advanced therapies like CAVT by 10%, this case hospital could see up to a 75% gain in contribution margin and overall reduction in hospital resource utilization

Health Economic Case with CAVT[b]

Large Academic Hospital

- >600 beds
- Current PE patients based on claims = 5,255
- 10% of patients treated with CAVT

Expenses

- General routine care
- Accommodations
- Med surge supplies
- Pharmacy, OR, lab, or other services
- Other surgical services

	CAVT	Anticoagulation
Average Reimbursement[c]	$18,086,859	$5,473,191

Increase in Contribution Margin with Increased CAVT Usage = $5,570,927 (75% over AC)

Improved service line contribution margin can be reinvested to improve disease state awareness and implement effective treatment algorithms. Reduced hospital resource burden can lead to improved staff retention and satisfaction.

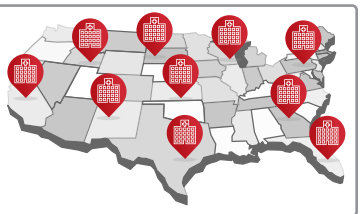
a. Composite complications is defined by Vizient and in this study includes: In Hospital Stroke, GI Hemorrhage Prevention, Post Operative Infection, Hospital Acquired AMI, Readmit for Infection Due to Previous Care, Readmit for other complications of internal device/Implant/Graph, Readmit for Other Surgical Wound Complications, Infection/Inflammation Due to Internal Device/Implant/Graph, Post Operative Shock, Aspiration/Pneumonia, C-Diff.
b. Case example shown from a large academic hospital's data gathered from Vizient CDB. The hospital's average reimbursement rate per CAVT PE case was compared to the average reimbursement rate per anticoagulation PE case. The cost of expenses (as further detailed above) was subtracted from both reimbursement amounts to provide an estimated net income per case which was multiplied by 525 (10% of example hospital's annual PE case load). The difference between these totals reflects the estimated contribution margin for an increased 10% of patients treated with CAVT vs. an increased 10% of patients treated with anticoagulation. Data on file at Penumbra, Inc. c. Annual PE claims. 1. Patel P, Dohad S, Moriarty J, et al. Healthcare resource utilization and outcomes among patients with intermediate-risk pulmonary embolism treated with computer-assisted vacuum thrombectomy versus other treatment modalities. Presented at: VIVA (Vascular InterVentional Advances) 2024; 04 November 2024; Las Vegas, NV.

The reimbursement and cost information provided by Penumbra is gathered from third-party sources and is subject to change without notice as a result of complex and frequently changing laws, regulations, rules and policies. Providers should treat patients as is clinically appropriate, and without regard to the payment amounts. All costs listed herein are estimates and are provided for illustrative purposes only. Individual hospital costs may vary and should be verified by hospital.

Methods: Rigorous 1:1 Propensity Score Matched by SG2

Data Source and Study Sample

Vizient Clinical Data Base[2]
07/01/2020 – 09/30/2023



ICD-10 diagnosis codes used to identify intermediate-risk PE patients

ICD-10 procedure codes used to identify treatment group and exclude high-risk and low-risk PE patients

Propensity Score Matching (1:1)

- Payer type
- Demographics (Incl. Elixhauser Comorbidity Index)
- Hospital type

Number of Patients

CAVT	AC	CDL	Other MT
515	515	515	515

Age Cohort

Patients ≥ 18 years

Encounter Type

Intermediate-risk patients only; inpatient only

MS-DRGs

Limited to 163–168 (CDL, CAVT & Other MT) and 175–176 (Anticoagulation)

Massive Proxy

Encounters using vasopressors, experiencing shock or needing CPR preceding procedure have been removed

Inclusion

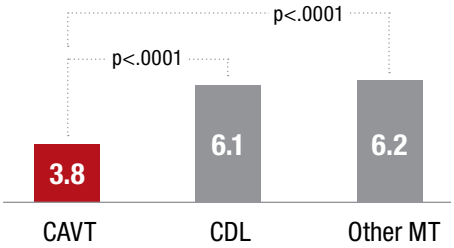
- CAVT (Lightning 12 & Lightning Flash 1.0)
- Catheter-directed thrombolysis (CDL, incl. CDT & USCDL)
- Other mechanical thrombectomy (excl. CAVT)
- For anticoagulation in the absence of procedure codes only patients who had elevated values of troponin at admission thereby excluding low-risk PE pts

Exclusion

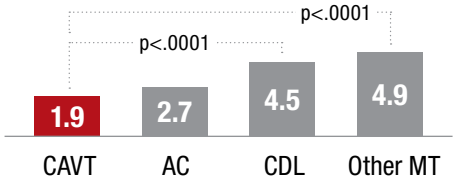
- If an encounter had more than one procedure on the same day or preceding day the encounter was excluded
- Encounters are excluded if systemic thrombolysis is utilized

Results:

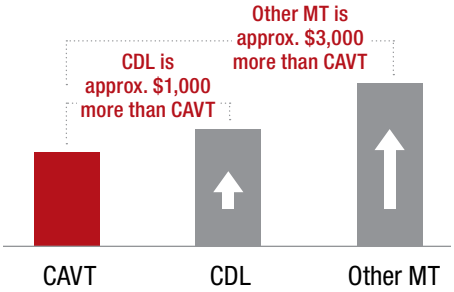
Post-Procedure Length of Stay (Days)



Acute Kidney Injury Development (%)



Total Procedure Cost



2. Vizient Clinical Data Base. Irving, TX: Vizient, Inc.; 2023. https://www.vizientinc.com. Accessed: May 2024.

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