Financial Implications of Venous Thrombectomy vs. Intravenous Anticoagulation for PE and DVT Management

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Purpose:

The purpose of this analysis is to better understand the financial implications of venous thrombectomy procedures. We are comparing the true cost of the mechanical thrombectomy to the current standard treatment, intravenous anticoagulation, for deep venous thrombosis (DVT) and pulmonary embolism (PE).

Background:

Venous thrombectomy may be a crucial tool in moderate to severe cases though hospitals may face high costs in delivering these treatments due to high cost of thrombectomy devices. Understanding the return on investment (ROI) for these procedures can be helpful in informing resource allocation. This financial analysis helps inform value-based care for venous thrombosis in PE and DVT in balancing clinical benefit with fiscal responsibility.

Methods:

We conducted a retrospective analysis from 2021 to 2023 at Torrance Memorial Medical Center to understand the total cost of patients diagnosed with DVT or PE from the day of admission to day of discharge and compare the group with standard treatment vs. thrombectomy treatment. Cases and procedure data were identified using the ICD-10 diagnosis, grouped by Medicare Severity Diagnosis-Related Groups (MS-DRG) categories. Financial data, such as total direct and indirect costs, charges, and adjustment payments were extracted from the hospital system. Financial metrics including net margin and return on investment (ROI) was calculated to determine the profitability and financial sustainability of thrombectomy procedures.

MS-DRG	MS-DRG Title
163	MAJOR CHEST PROCEDURES WITH MCC
164	MAJOR CHEST PROCEDURES WITH CC
165	MAJOR CHEST PROCEDURES WITHOUT CC/MCC
166	OTHER RESPIRATORY SYSTEM O.R. PROCEDURES WITH MCC
167	OTHER RESPIRATORY SYSTEM O.R. PROCEDURES WITH CC
168	OTHER RESPIRATORY SYSTEM O.R. PROCEDURES WITHOUT CC/MCC
175	PULMONARY EMBOLISM WITH MCC OR ACUTE COR PULMONALE
176	PULMONARY EMBOLISM WITHOUT MCC
228	OTHER CARDIOTHORACIC PROCEDURES WITH MCC
229	OTHER CARDIOTHORACIC PROCEDURES WITHOUT MCC
252	OTHER VASCULAR PROCEDURES WITH MCC
252	OTHER VASCULAR PROCEDURES WITH CC
253	OTHER VASCULAR PROCEDURES WITHOUT CC/MCC
254	OTHER MAJOR CARDIOVASCULAR PROCEDURES WITH MCC
270	OTHER MAJOR CARDIOVASCULAR PROCEDURES WITH CC
271	OTHER MAJOR CARDIOVASCULAR PROCEDURES WITHOUT CC/MCC
272	PERIPHERAL VASCULAR DISORDERS WITH MCC
299	PERIPHERAL VASCULAR DISORDERS WITH CC
300	PERIPHERAL VASCULAR DISORDERS WITHOUT CC/MCC
301	MAJOR CHEST PROCEDURES WITH MCC

Table 1: The DRG codes are considered based on their clinical association with thrombectomy procedures as well as pulmonary embolism and deep vein thrombosis diagnoses.

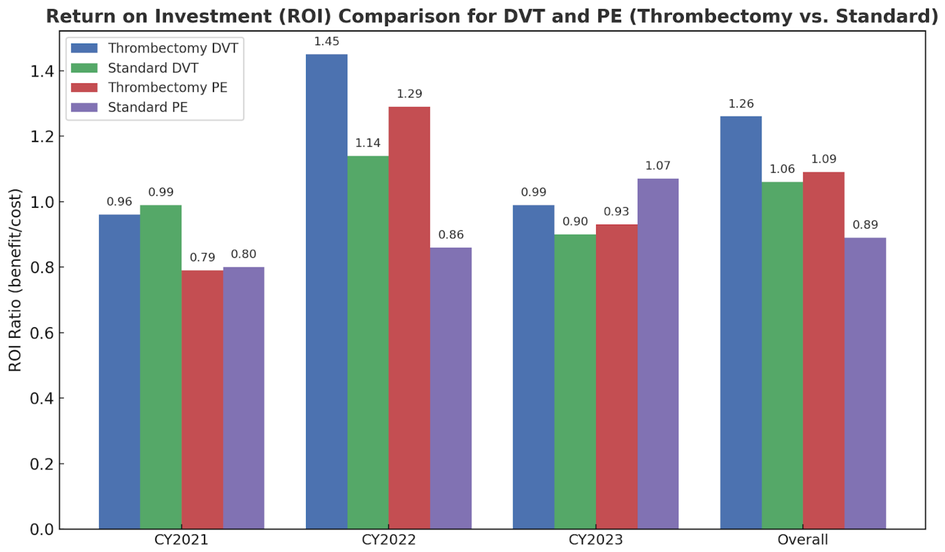

Figure 1: Return on investment (ROI) ratios (benefit-to-cost) for thrombectomy versus standard care in the treatment of deep vein thrombosis (DVT) and pulmonary embolism (PE) across three calendar years (CY2021–CY2023) and overall. Four groups are compared: Thrombectomy DVT (blue), Standard DVT (green), Thrombectomy PE (red), and Standard PE (purple)

Results

For DVT, treatment with thrombectomy had a superior overall ROI ratio to standard treatment (1.26 vs. 1.06). Thrombectomy-treated DVT cases also showed a higher percentage of paid charges (15.51% vs. 13.98%). For PE, the overall ROI ratio was also higher for thrombectomy compared to standard (1.09 vs. 0.89). Notably, thrombectomy had consistently higher adjusted payments and margins despite greater direct and indirect costs.

Discussion

Venous thrombectomy for DVT and PE demonstrates higher financial performance compared to standard treatments, with superior ROI ratios and net margins. These findings show that although thrombectomy incurs greater direct and indirect costs, it aligns with the principles of high-value care. This analysis's limitation is that ROI estimates do not capture clinical outcomes or operational benefits, such as reduced readmissions, which may also influence the value of thrombectomy programs. Despite this limitation, the methodology offers important applications. It can be used to evaluate the financial impact of adopting or expanding thrombectomy programs and to support business cases for capital investments, such as new thrombectomy devices. The framework also allows benchmarking of DRG-level financial performance and can inform value-based care models and bundled payment arrangements, providing a foundation for aligning financial and clinical strategies.