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Abstracts from the 2022 Southern Association for Vascular Surgery Annual Meeting

SAVS1.



Drastic Increase in Hospital Labor Costs During the COVID-19 Pandemic Leads to Sustained Financial Loss for an Academic Vascular Surgery Division

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Objective: The financial impact of the COVID-19 pandemic has fundamentally changed the healthcare environment, with hospitals expected to lose billions in 2021. A preexisting nationwide nursing shortage has drastically worsened during the pandemic, causing a dramatic increase in labor costs and further straining an economically fragile US healthcare system. Although the Medicare Coronavirus Aid, Relief, and Economic Security Act allocated more than \$350 billion for distribution in ongoing phases, funds have not been specifically assigned to increased labor costs amid nursing shortages. We sought to examine the evolution and financial impact of these changes during repeated pandemic surges within a vascular surgery division at a tertiary center.

Methods: Operating room, inpatient unit, and outpatient clinic financial data were examined retrospectively. Monthly averages from a 14-month control cohort, January 2019 to February 2020 (pre-COVID), were compared with five interval groups of sequential, 3-month cohorts from March 2020 through May 2021 (groups 1-5). Fiscal impact was analyzed from real revenue and cost data derived from actual hospital accounting records, not Medicare estimates or hospital administration projections.

Results: Monthly relative value unit (RVU) generation rebounded to and exceeded the pre-pandemic mean (2520) after an isolated drop in the early pandemic (group 1, n = 1734), with values ranging from 2540 to 2863 per month in groups 2 to 5 after government restrictions on elective cases were eased in May 2020. Contribution to indirect, or profit, showed a similar initial pattern, with a drastic drop in group 1 followed by a swift rebound (group 2). Despite increased RVU, there was a severe decline in vascular contribution to indirect, inpatient, and outpatient margins as the pandemic progressed through several phases (groups 3-5), with concomitant, sharp increases in nursing costs (Table, Figure). Nursing labor expenses are broken down on a per-case and per-patient-day basis, demonstrating sustained and severe increases through May 2021. Outpatient clinic margins show a particularly concerning trend, with decreases of 276% and 281% in groups 4 and 5, respectively, compared with pre-COVID figures. System-wide, agency-related nursing costs have increased from \$4.9 to \$13.6 million/month (+178%) in 2021 compared with 2020.

Conclusions: Our results demonstrate a progressive, drastic increase in nursing labor costs during the pandemic, with a resultant, sustained erosion of financial margins despite a level of clinical productivity, as measured in RVU, that exceeds pre-pandemic standards. To our knowledge, this report is the first detailed analysis of this phenomenon and its impact on a surgical division. The unique access to and utilization of actual hospital accounting figures instead of Medicare estimates or hospital administration projections increases the accuracy and generalizability of the examined data. Clearly, this precarious national trend is not sustainable, and correction will require significant, targeted funding from future phases of the Coronavirus Aid, Relief, and Economic Security Act and other federal relief packages.

Table. Vascular financial margins and nursing costs during the COVID-19 pandemic

Category	Pre-COVID	Group 1 (Mar, Apr, May 2020)	Group 2 (Jun, Jul, Aug 2020)	Group 3 (Sept, Oct, Nov 2020)	Group 4 (Dec 20, Jan, Feb 2021)	Group 5 (Mar, Apr, May 2021)
Margin category						
Total contribution to indirect/month, \$ in thousands	409.7	181.6 (−56%; P < .001)	510.1 (+24%; P = .01)	438.4 (+7%; P = .33)	364.2 (−11%; P = .04)	294.2 (−28%; P = .009)
Vascular hospital margin/month, \$ in thousands	383.3	319.3 (−16%; P = .03)	454.3 (+19%; P = .03)	403.3 (+5%; P = .48)	410.7 (+7%; P = .61)	342.0 (−11%; P = .04)
Vascular outpatient clinic margin/month, \$	26,448	(−) 137,406.4 (−619%; P < .001)	55,782 (+111%; P < .001)	35,048.9 (+33%; P = .01)	(−) 46,532.6 (−276%; P < .001)	(−) 47,766.7 (−281%; P < .001)
Cost category						
Vascular nursing unit cost/month, \$ in thousands	225.4	249.8 (+11%; P = .78)	309.9 (+36%; P = .02)	268.1 (+19%; P = .04)	368.6 (+63%; P < .001)	372.3 (+65%; P < .001)
Vascular nursing unit expense per case, \$	2042.1	2854.5 (+39%; P = .02)	2629.8 (+29%; P = .03)	2358.2 (+16%; P = .09)	3120.3 (+53%; P = .002)	3214.3 (+57%; P < .001)
Vascular nursing labor expense per patient day, \$	667.8	860.2 (+29%; P = .004)	846.1 (+27%; P = .005)	892.4 (+34%; P < .001)	938.4 (+41%; P < .001)	930 (+39%; P < .001)

Significant decreases in total the contribution to indirect (CTI) or profit, inpatient/hospital margin, and outpatient margin were observed as the surges of the pandemic evolved and nursing costs continue to increase dramatically.

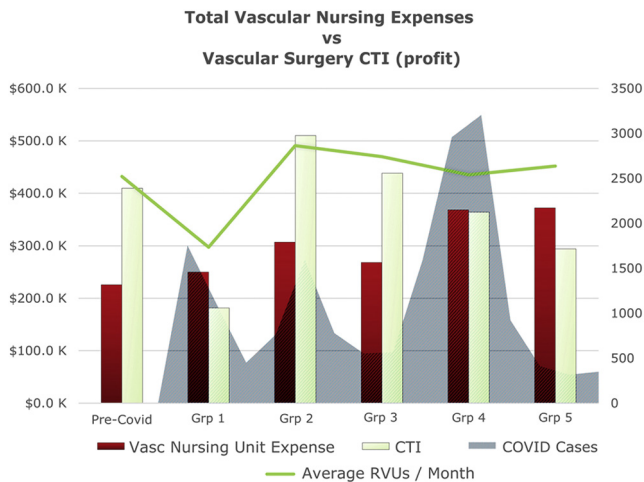


Fig. Total vascular nursing expense and vascular surgery contribution to indirect (CTI) during the COVID-19 pandemic. Increasing nursing expenses (red bar) follow COVID surges in New Orleans (grey), leading to decreased CTI/profit (green bar) despite increased relative value unit (RVU) production (green line) during the pandemic.

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SAVS2.



Vascular Surgery Is the Most Commonly Consulted Specialty for Emergent Operative Trauma

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Background: Despite an increasing rate of intraoperative consultation of vascular surgery for trauma patients, vascular surgery is not one of the subspecialties required for American College of Surgeons level I trauma center verification. We sought to assess rates and patterns of emergent operative vascular surgery consultation compared with other surgical subspecialties in the trauma setting.

Methods: A retrospective analysis was performed on all patients who presented with traumatic injuries requiring emergent surgical operations (<3 hours) from January 1, 2015, to December 31, 2019, at a level I trauma center. Patient demographics, injury characteristics, and data on consulted surgical specialties were collected. The primary outcome measured was the rate of intraoperative consultation to vascular surgery (VS) and other subspecialties (OS).

Results: We identified 2265 patients with a total of 221 emergent operative consults to VS and 507 consults to OS. After VS (9.8%), the most common subspecialties consulted were orthopedics (9.2%) and urology (5%) (Figure). Overall, VS was more likely to be consulted in immediate trauma operations (<1 hour) (65.6% vs 38.1; $P < .0001$), penetrating injuries (73.3% vs 47.9%; $P < .0001$), blunt injuries (19.15% vs 5.26%; $P < .0001$), and at night (60.6% vs 51.9%; $P = .02$) when compared with OS. Time from admission to operation was shorter for cases when VS was involved compared with OS (54.1 ± 40.4 minutes vs 80.6 ± 47.9 minutes; $P < .0001$). In a multivariable logistic regression model predicting immediate trauma operations (<1 hour), VS was 43% more likely to be involved compared with OS (odds ratio, 1.43; 95% confidence interval, 1.05-1.95).

Conclusions: Vascular surgeons are consulted intraoperatively to assist with emergent trauma at a greater rate compared with specialties that are required for level I trauma center verification. Current American College of Surgeons verification processes and site-specific policies should be re-evaluated to consider VS coverage as a requirement for trauma center verification.

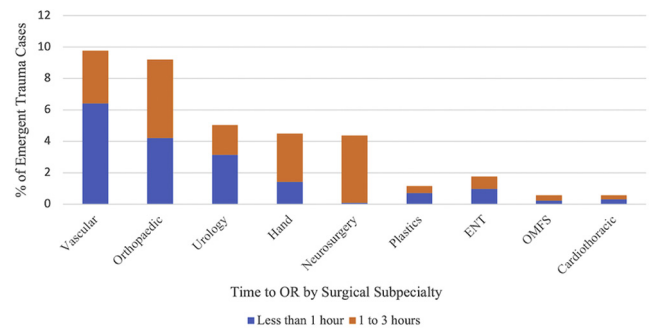


Fig. Emergent trauma operative consult distribution by specialty.

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SAVS3.



Index Atherectomy Peripheral Vascular Interventions Performed for Claudication Are Associated With More Reinterventions Than Nonatherectomy Procedures

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Background: Despite limited evidence supporting atherectomy over stenting/angioplasty during index peripheral vascular interventions (PVI), the use of atherectomy has rapidly increased in recent years. We previously identified a wide distribution of atherectomy practice patterns among US physicians. The aim of this study was to investigate the association of index atherectomy with reintervention.

Methods: We used 100% Medicare fee-for-service claims to identify all beneficiaries who underwent elective first-time femoropopliteal PVI for claudication in 2019. Subsequent PVI reinterventions were recorded through December 2020. Kaplan-Meier curves were used to compare the rate of PVI reinterventions for patients who received index atherectomy versus nonatherectomy, and according to physician practice patterns. A hierarchical Cox proportional hazard model was used to evaluate patient and physician-level characteristics associated with reinterventions.

Results: A total of 15,279 patients underwent index PVI for claudication in 2019, of which 59.6% were atherectomy. After a median of 435 days (interquartile range, 78-573 days) of follow-up, 38.6% of patients underwent a PVI reintervention, including 46.4% of patients who underwent index atherectomy versus 27.1% of patients who underwent index nonatherectomy ($P < .001$; Fig 1). Patients treated by high physician users of atherectomy (quartile 4) received more reinterventions than patients treated by standard physician users (quartiles 1-3) (54.6% vs 36.5%; $P < .001$; Fig 2). After adjustment, patient factors associated with PVI reintervention included receipt of index atherectomy (adjusted hazard ratio [aHR], 1.33; 95% confidence interval [CI], 1.20-1.47), Black race (vs White, aHR, 1.19; 95% CI, 1.09-1.30), diabetes (aHR, 1.14; 95% CI, 1.07-1.22), and urban residence (aHR, 1.11; 95% CI, 1.02-1.22). Physician factors associated with reintervention included male sex (aHR, 1.75; 95% CI, 1.28-2.44), high-volume PVI practices (aHR, 1.23; 95% CI, 1.12-1.35), physicians working primarily at ambulatory surgery centers or office-based laboratories (aHR, 1.11; 95% CI, 1.01-1.21), and physicians with a high use of index atherectomy (aHR, 1.56; 95% CI, 1.35-1.80). Vascular surgeons had a lower risk of PVI reintervention than cardiologists (aHR, 0.82; 95% CI, 0.76-0.88), radiologists (aHR, 0.64; 95% CI, 0.57-0.72), and other specialties (aHR, 0.69; 95% CI, 0.57-0.80).

Conclusions: The use of atherectomy during the index PVI for claudication is associated with higher PVI reintervention rates compared with other technologies. Similarly, high physician users of atherectomy and physicians in outpatient settings perform more PVI reinterventions than their peers. The appropriateness of using atherectomy for initial treatment of claudication needs critical reevaluation.