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Antithrombotic therapy following lower extremity endovascular revascularization: The results of a survey of vascular specialists

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Abstract

Objective: Antithrombotic therapy improves endovascular intervention outcomes for peripheral artery disease. However, there are limited data guiding the choice and duration of these adjuvant therapies. Thus, we explored current antithrombotic prescribing preferences among vascular interventionalists, hypothesizing that there are varied and inconsistent treatment practices among providers.

Methods: We developed and distributed a de-identified RedCap survey via Twitter and email to Vascular Quality Initiative members (February 2023). Multiple-choice questions queried antithrombotic agents and treatment durations for a clinical vignette (a claudicant on 81 mg aspirin and statin) with different arterial disease locations (iliac, femoropopliteal, or tibial vessels) and different revascularization strategies (angioplasty or stenting, with and without drug-coating). Antithrombotic options included monotherapies with antiplatelet agents or low-dose rivaroxaban; dual therapies with aspirin combined with a P2Y12 inhibitor (dual antiplatelet therapy, DAPT) or low-dose rivaroxaban (dual pathway inhibition or DPI); or triple therapy with aspirin, a P2Y12

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inhibitor, and low-dose rivaroxaban. Options for therapy duration included 30, 90, 180, and 365 days, or indefinitely.

Results: There were 199 respondents (17% female, 68% White race, 63% academic, 88% vascular surgery). Across all treatment scenarios, respondents selected DAPT (n = 171/199; 86%) in at least one revascularization scenario, followed by aspirin monotherapy (n = 83/199; 42%) and DPI (n = 49/199; 25%). Therapy choice did differ by both anatomic location and revascularization strategy ($P < .05$). DAPT was most selected following femoropopliteal revascularization (n = 165/199, 83%) and bare metal stenting (n = 162/198, 82%). However, aspirin monotherapy was most selected following iliac level revascularization (n = 52/197; 26%) and following percutaneous transluminal angioplasty at any level (n = 51/182; 28%). DPI was most selected following tibial revascularization (n = 39/184; 21%) and following percutaneous transluminal angioplasty (n = 38/182; 21%). Among those who selected DAPT, the 90-day (n = 99/171; 58%) duration was preferred. Those who selected DPI favored indefinite treatment durations (n = 34/49; 69%). Indefinite DAPT and DPI therapy were more commonly selected for distal level revascularization ($P < .05$). Rivaroxaban utilization was limited secondary to cost (n = 108/178; 61%), lack of demonstrated effectiveness (n = 75/178; 42%), and concern for safety and bleeding (n = 27/178; 15%).

Conclusions: Following lower extremity endovascular treatment of peripheral artery disease, a 90-day duration of DAPT remains the most commonly selected antithrombotic regimen despite the emergence of DPI as an evidence-based antithrombotic therapy. The variability in provider preferred antithrombotic agent and treatment duration emphasizes the need for high-quality evidence for the medical optimization of revascularization outcomes.

Keywords

Antithrombotic treatment; Claudication; Critical limb-threatening ischemia; Dual antiplatelet therapy; Dual pathway inhibition; Peripheral artery disease

Endovascular approaches to treating patients with symptomatic peripheral artery disease (PAD) have become a cornerstone therapy, but they suffer from limited durability.[1–4] Intimal hyperplasia and progression of atherosclerosis contribute to restenosis and acute thrombosis of the treated vessel, both of which can be reduced by antithrombotic therapy.[5–8] However, the benefits of antithrombotic therapies, including antiplatelets and anticoagulation, must be balanced against the associated risk of bleeding.[7,9]

The three most commonly used antithrombotic regimens following PAD revascularization include antiplatelet monotherapy, dual antiplatelet therapy (DAPT) with both aspirin and a P2Y12-inhibitor, and dual pathway inhibition (DPI) with both antiplatelet and low dose anti-Xa inhibitors. The benefit of DAPT following PAD interventions has largely been extrapolated from level-one data for antithrombotic therapy for percutaneous coronary interventions (PCIs),[9,10] secondary analyses of randomized clinical trials (RCTs) testing alternative hypotheses in combination, and observational studies.[1,2,6,8,11–13] However, the recent Vascular Outcomes Study of Aspirin Along with Rivaroxaban in Endovascular or Surgical Limb Revascularization for PAD (VOYAGER PAD) trial was the first large-scale RCT that specifically evaluated adjuvant antithrombotic therapies for lower extremity PAD

revascularization.[7] This trial concluded that DPI for 1 year post-revascularization improved limb salvage and cardiovascular outcomes when compared with aspirin alone with a modest increase in major bleeding.[7] However, details of revascularization were limited, and non-randomized use of P2Y12 inhibitors was allowed in the trial, leaving uncertainty as to the optimal antithrombotic regimen in this setting. In addition, the duration of antithrombotic treatment has been largely unstudied in PAD.

With the evolution of antithrombotic regimens, we hypothesized that prescribing preferences for these therapies will vary widely among vascular specialists performing lower extremity revascularization for PAD, including vascular and cardiac surgeons, and interventional cardiologists and radiologists. We aimed to define and understand the preferences among surgeons and interventionalists who perform endovascular interventions for PAD through a deidentified survey disseminated to members of the multidisciplinary Vascular Quality Initiative (VQI).

METHODS

Survey development and distribution.

This study was approved by the University of Pittsburgh's Human Research Protection Office under an exemption for informed consent (STUDY22020197). We developed and distributed a de-identified RedCap survey (Supplementary Fig, online only), and recruitment for survey participation occurred via email and social media in February 2023. The VQI sent three separate emails to all of its members, soliciting and encouraging survey participation. Via Twitter, the co-authors (two original tweets from our institutional twitter account with 17 retweets by co-authors and the Eastern, Southern, and Western Vascular Societies and the Society of Vascular Surgery [SVS]). VQI membership includes physicians from over 1000 medical centers in North America, with over 2000 vascular specialists contributing to the peripheral vascular intervention (PVI) dataset. Members span different practice types (28% academic, 30% teaching, and 42% community), physician specialties (42% vascular surgery, 16% interventional cardiology, 14% interventional radiology, and 5% cardiothoracic surgery), and two countries (99% United States and 1% Canada).[14]

Multiple-choice questions were designed to identify respondent prescribing preferences and demographics, including gender, race, ethnicity, specialty, practice setting, region, and interventions per month. Each question was based on a 70-year-old 70 kg non-smoker on 81 mg aspirin and statin therapy undergoing their first angiogram. We included a total of seven distinct treatment scenarios that differed by anatomic location and by revascularization strategy: (1) iliac bare metal stenting (BMS); (2) femoropopliteal BMS; (3) femoropopliteal plain percutaneous transluminal angioplasty (PTA); (4) tibial PTA; (5) femoropopliteal drug-eluting stent (DES); (6) tibial DES; and (7) femoropopliteal drug-coated balloon (Supplementary Fig, online only).

The survey included a maximum of 51 questions. The first 36 questions addressed antithrombotic preferences, followed by 15 demographic questions.[15,16] Among each of the seven scenarios, respondents confirmed their practices included each of the treatment scenarios. They were then queried about their antithrombotic preferences with three

questions to identify their choice of: (1) antithrombotic therapy; (2) the specific medication prescribed; and (3) treatment duration. Antithrombotic therapies included: (1) aspirin monotherapy; (2) aspirin plus an additional antithrombotic agent; (3) aspirin plus another two additional antithrombotic agents (ie, triple therapy); or (4) discontinuation of the existing aspirin and prescribe a different antithrombotic agent. The RedCap branched logic then generated a second question for respondents who selected answer choices 2 to 4 for the first question. The second question queried specific agent preferences including: (1) clopidogrel; (2) ticagrelor; (3) prasugrel; (4) rivaroxaban; or (5) other. The third question queried the duration of the post-intervention antithrombotic therapy (other than aspirin) from: (1) 30 days; (2) 90 days; (3) 180 days; (4) 365 days; or (5) indefinitely. For example, in the scenario of iliac disease treated with a BMS, if aspirin plus an additional antithrombotic agent is selected, the respondent would be prompted to select the additional agent of choice (ie, clopidogrel) and then the duration of treatment (ie, 90 days). Among those who did not select low dose anti-Xa inhibitor (ie, 2.5 mg rivaroxaban) as a preferred therapy, the RedCap branched logic offered reasons for treatment omission including: (1) inadequate data suggesting use reduces poor lower extremity outcomes; (2) inadequate data suggesting use is safe; (3) use is cost prohibitive for my patients; or (4) other. All “other” answer selections generated an open-ended question that queried any therapies that were not included in these choices (Supplementary Fig, online only).

Data analysis.

All respondent data are presented. Responses were pooled including all answers for questions for which multiple answers could be selected. We then evaluated the responses by anatomic location and by revascularization strategy, so that any affirmative response in at least one scenario for a particular medication indicated provider use. For example, if a respondent prescribed DAPT for an iliac BMS and aspirin monotherapy for all other treatments, they were recorded affirmative for both DAPT and aspirin overall. That same response was counted as affirmative for DAPT for iliac treatment, but not tibial or femoropopliteal, as they selected only aspirin monotherapy for distal disease/treatment distributions. Similarly, that response was also counted as DAPT affirmative for BMS but not DES, PTA, or drug-coated balloon. All data were compared using χ^2 or Fisher exact testing using Stata (17.0; StataCorp). All figures were generated using Prism (GraphPad 9.0).

RESULTS

Baseline characteristics.

There were 199 respondents (17% female; 68% White race; 63% academic practice), with United States (91%) and international (9%) representation. Respondents included predominantly surgeons (88% vascular, 1% cardiothoracic) as well as non-surgical interventionalists (5% cardiology, 5% radiology) with 55% reporting >20 years in practice and 61% completing >5 endovascular PAD interventions per month (Table). A total of 88% of respondents answered the survey to completion (88% clinical and 87% demographic question completion).

Antithrombotic treatment choice.

Across treatment scenarios, respondents selected DAPT (n = 171/199; 86%) in at least one treatment scenario, followed by aspirin monotherapy (n = 83/199; 42%) and DPI (n = 49/199; 25%) (Fig 1, A). Of respondents, 44% (88/199) consistently prescribed the same therapy independent of the anatomic location and/or intervention type. Among providers who did not alter their prescribing patterns, the most common therapy selected was DAPT (n = 75/88; 85%) followed by DPI (n = 10/88; 11%). The remaining 56% (n = 111/199) of respondents changed antithrombotic regimens based on anatomic location (n = 36/199; 18%), revascularization strategy (n = 21/199; 11%), or both (n = 54/199; 27%).

Among the pooled data across all respondents, antithrombotic therapy preferences did change with anatomic treatment location across any revascularization strategy ($P < .0001$) as well as with revascularization strategy at any anatomic location ($P = .001$). DAPT was most often selected following femoropopliteal-level revascularization (n = 165/199; 83%) and following any treatment with BMS (n = 162/198; 82%). However, aspirin monotherapy was most often selected following iliac-level revascularization (n = 52/197; 26%) and following any PTA (n = 51/182; 28%). DPI was most often selected following tibial level revascularization (n = 39/184; 21%) and following any PTA (n = 38/182; 21%) (Fig 1, B and C). Overall, triple therapy (n = 27/199; 14%) and monotherapy other than aspirin (n = 5/199; 3%) were infrequently selected as preferred therapy (Fig 1, A). Among all antithrombotic options, alternative P2Y12 agents such as ticagrelor and prasugrel were infrequently selected as preferred therapy (<2% of respondents).

Duration of treatment.

Among those who preferred DAPT, the 90-day (n = 99/171; 58%) treatment duration was the most commonly selected, followed by an indefinite duration (n = 63/171; 37%) (Fig 2, A). Sixty percent of respondents (n = 103/171) who selected DAPT did not change duration across anatomic location or revascularization strategy. Among this cohort, 90-day duration (n = 51/103; 50%) was also most commonly selected, followed by indefinite duration(n = 24/103; 23%). The remaining 40% of respondents (n = 68/171) changed the duration of therapy based upon anatomic location (n = 8/171; 5%), revascularization strategy (n = 3/171; 2%), or both (n = 57/171; 33%). Indefinite DAPT duration was more common with tibial revascularization and with PTA (Fig 2, B and C). Most respondents who selected DPI preferred indefinite use (n = 34/49; 69%) (Fig 2, D). DPI duration did not differ by anatomic location or by revascularization strategy (Fig 2, E and F).

Low-dose rivaroxaban utilization.

The majority (89%; n = 178/199) of respondents did not select DPI in any treatment scenario and were queried for reasons for not using low-dose rivaroxaban. Cost was the most common reason selected (n = 108/178; 61%), followed by a lack of data demonstrating effectiveness (n = 75/178; 42%) and safety (n = 27/178; 15%). Surgeons (n = 36/164; 22%) as compared with non-surgical interventionalists (n = 6/12; 50%; $P = .038$) and respondents in the Northeast (n = 5/49; 10%) as compared with other regions (n = 37/127; 29%, $P = .019$) less frequently selected DPI (Fig 3; Table).

DISCUSSION

Our survey demonstrated that antithrombotic preferences varied among vascular specialists treating patients for lower extremity PAD. However, 90-day DAPT with aspirin and clopidogrel was the most frequently selected antithrombotic regimen after lower extremity endovascular interventions,[6–8,11,17–21] followed by aspirin monotherapy, and then DPI. Respondents cited high costs and insufficient effectiveness and safety data as reasons for not selecting DPI.

The benefit of P2Y12 inhibitors following lower extremity endovascular interventions has been predominantly extrapolated from studies evaluating outcomes following PCI.[9,10] Early work suggested superiority of clopidogrel monotherapy over aspirin monotherapy in secondary analyses of the Clopidogrel vs Aspirin in Patients at Risk of Ischemic Events (CAPRIE) trial.[17] However, among the respondents who selected monotherapy in our survey, aspirin was the most frequently selected. Survey responses predominantly reflect the existing data with most selecting DAPT. Specifically, one small RCT (N = 80),[6] several subgroup analyses of patients undergoing lower extremity revascularization nested within large cardiovascular RCTs,[12,22] systematic reviews,[8,18] and retrospective studies[11,23] have all reported both limb and cardiovascular advantages of DAPT over aspirin monotherapy.

In DAPT regimens, clopidogrel is the most commonly used secondary agent. Clopidogrel effectiveness is impacted by the prevalence of single nucleotide polymorphisms (SNPs)[24,25] that reduce antiplatelet activity by inhibiting the conversion of the clopidogrel prodrug to its active form. Aspirin effectiveness may also be impacted by pharmacogenomic factors such as polymorphisms in cyclooxygenase-1, but these are not well-established, and aspirin resistance is most often multifactorial due to noncompliance, drug interactions, and rapid platelet turnover.[26] Nearly one in three patients with PAD possess SNPs that result in clopidogrel resistance.[25] There is significant evidence demonstrating adverse events among patients with clopidogrel resistance following PCI[27] as well as following revascularization for ischemic stroke.[28,29] As a result, recent large scale RCTs support the use of potent P2Y12 inhibitors (ie, ticagrelor and prasugrel) which are not impacted by these SNPs following PCI for acute ischemic events.[12,30,31] However, in the setting of PAD, there are little data demonstrating the adverse events associated with clopidogrel resistance to guide the use of potent P2Y12 inhibitors after peripheral revascularization.[32–34] We found that fewer than 2% of respondents selected alternative P2Y12 inhibitors, which parallels historically documented prescribing patterns[21,35] and is in keeping with this lack of evidence. Despite the evolution of guidelines for the use of clopidogrel or potent inhibitors following PCI, these practices have not permeated to the treatment of PAD with peripheral interventions, which in turn may lead to poor outcomes.[32] This highlights the inherent limitations in extrapolating PCI data to lower extremity revascularization and stresses the need for nuanced, disease-specific investigation.

Unlike clopidogrel, anti-Xa therapies are not affected by pharmacogenomic SNPs and are thus an attractive antithrombotic option. The VOYAGER study randomized 6000 patients undergoing lower extremity revascularization to DPI or aspirin and placebo and demonstrated that DPI reduced limb or cardiovascular adverse events by 15%.[7] Despite

these findings, only one-quarter of respondents of our survey indicated they would prescribe DPI. This minimal adoption of DPI is reflected in the real world VQI data as well.[20] Reasons provided for not selecting low-dose rivaroxaban in our survey centered around medication cost and the lack of high-quality evidence of effectiveness, especially among surgeons. The significant cost concerns should be ameliorated once rivaroxaban comes off patent protection in 2024. Unfortunately, rigorous clinical trial data evaluating adjuvant antithrombotic therapies for lower extremity revascularization remain sparse, with the VOYAGER study being the only large scale RCT examining antithrombotic therapy following peripheral revascularization. The support for other therapies comes from incomplete and fragmented data obtained from synthesis of numerous secondary analyses, real-world data, and institutional experiences. As a result, the most recent clinical practice guidelines suggest DPI as first-line therapy after lower extremity revascularization.[36] These recommendations are a product of the lack of level 1 data comparing DPI with DAPT following peripheral revascularization.[36,37] Further, the secondary comparisons of those exposed to clopidogrel, allowed at the discretion of providers, are limited and subject to potential unmeasured confounding and indication bias.[7] Therefore, our study results highlight that, despite the recently published guidelines, more data are still needed to support DPI adoption within clinical practice.

Unfortunately, the paucity of available data evaluating the optimal adjuvant antithrombotic therapy following lower extremity revascularization is rivaled only by the lack of data guiding the duration of this therapy. There are no level 1 data investigating the optimal duration of antithrombotic therapy following revascularization for PAD. The duration of DAPT following endovascular interventions was evaluated among three retrospective cohort studies that yielded mixed results, leading to broad recommendations of 1 to 6 months of post-revascularization DAPT by vascular societies.[1,23,38,39] Without more specific guidance, the 90-day duration of DAPT following peripheral interventions is most likely derived from evidence following ischemic stroke.[40,41] There are no current studies comparing DPI durations. All patients in the VOYAGER trial received 1 year of therapy,[7] and the COMPASS trial suggested using DPI indefinitely as medical optimization in PAD.[42] Thus, the survey respondents who selected DPI tended to also select indefinite treatment duration, despite the documented bleeding risks and lack of comparative evidence supporting the benefit of long-term DPI treatment.

In our study, the preferred antithrombotic regimen changed significantly by anatomic location and revascularization strategy. Respondents preferred longer durations and dual therapies for more distal or stent-based interventions, reflecting the increased risk of adverse events in these anatomic and intervention settings. Data clearly demonstrate that distal interventions are at an increased risk of patency loss through a variety of mechanisms.[1,43] Thus, providers likely select the more aggressive antithrombotic regimens with their inherent increased risk of bleeding to improve upon these outcomes without clear efficacy or effectiveness data. Further understanding of the pathobiology of PAD distribution and local responses to iatrogenic vascular injury may greatly inform the selection of the most effective adjuvant therapies. For example, histologic studies show distal PAD is more thrombotic in nature as compared with disease in proximal arteries that are more atherosclerotic in composition.[44] As such, distal interventions may respond better to DPI

with an anticoagulant to prevent in situ thrombosis. Stents, in contrast, are associated with increased vessel injury and changes in vessel compliance that initiate a prolonged healing response and enhanced inflammation that then mediates increased intimal hyperplasia and early restenosis.[45] Again, insight into the biologic responses to intervention will help us identify the most effective antithrombotic regimen to employ.

Our study highlights the need for adequately powered RCTs with appropriate subgroup analyses guided by both the existing literature and provider preferences hypothesizing optimal antithrombotic therapy combinations and durations. This is outlined as a key research priority within the most recent PAD guidelines.[36] Evaluating the outcomes of current interventions and medical therapies for PAD is also a research priority set by the SVS.[46] Such data could allow for the creation of algorithmic guidelines that would reduce the variability in practice patterns and, in turn, limit the frequency of secondary interventions needed to maintain patency and minimize bleeding, as well as reduce costly and devastating limb loss among patients with PAD. However, adequate data and guidelines are often not enough to change practice patterns. The evidence that high-intensity statins should be universally prescribed to patients with PAD is clear.[1,2,36] Despite this, usage remains as low as 12%.[47] Efforts to increase provider compliance with existing guidelines are necessary to improve outcomes in PAD, and will likely need to include a combination of increased education and incentivization.

Our study has several limitations. Although we generated common scenarios that are likely to be experienced by those performing endovascular interventions on patients with PAD, the model patient (70-year-old, non-smoker, treated with pre-procedure statin and aspirin) is not representative of the full spectrum of patients with PAD, and the simplified interventions are only a limited selection of the full range of treatment strategies that can be used to revascularize patients. Along the same lines, survey results summate responses to hypothetical endovascular revascularization scenarios and may not reflect real-world practices and scenarios, such as patients already on antiplatelet regimens and full-dose anticoagulation for other disease processes such as coronary artery disease and venous thromboembolism. Further, we did not ask respondents about clopidogrel resistance testing, which may have resulted in an underestimation of alternative P2Y12 inhibitor use. Additionally, we distributed the survey via email as well as Twitter to maximize and diversify participation. However, social media distribution may introduce falsified or bot respondents, although we think this risk was low given the lack of incentives to survey completion.[48] Furthermore, respondents were primarily surgeons, which limits the generalizability of our results and limits our ability to compare results between different types of vascular specialists. Although only 17% of respondents were female, 7% were Hispanic and 1% were Black; the overall membership of the Society for Vascular Surgery is about 15% female, 6% Hispanic, and 2% Black, indicating a representative sampling of surgeons.[49] Our estimated response rate, although limited by an unquantifiable number of individuals reached through social media, may reach as low as 9%, thus introducing non-response error. However, this may represent the expected response rate for physicians, with limited time available for non-clinical activities.[50] Finally, the demographic distribution of our respondents is consistent with demographics of vascular surgeons within the SVS,

and practice type (academic vs private) and geographic spread mirrors VQI constituents, thus minimizing potential response bias and maximizing the external validity of our results.

CONCLUSION

Following lower extremity endovascular intervention for PAD, 90-day DAPT remains the antithrombotic regimen of choice, despite the recent emergence of DPI as an evidence-based antithrombotic therapy. The variability in provider preferences for antithrombotic regimens highlights the lack of high-quality evidence optimizing outcomes in PAD and emphasizes the need to develop rigorous clinical trials to close this knowledge gap.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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ARTICLE HIGHLIGHTS

• Type of Research:

Multicenter, prospective cross-sectional study

• Key Findings:

A total of 1199 vascular specialists responded to our survey. Respondents selected 90-day dual antiplatelet therapy as the preferred antithrombotic regimen in at least one clinical scenario after lower extremity endovascular intervention, followed by aspirin monotherapy, followed by indefinite dual pathway inhibition with aspirin and low-dose rivaroxaban. Therapy choice differed significantly by disease distribution and revascularization strategy. The most common reasons for dual pathway inhibition omission were cost and lack of efficacy data.

• Take Home Message:

Post-intervention antithrombotic therapy selections varied widely across respondents, disease distribution, and revascularization strategy. The variability in provider preferences for antithrombotic regimens highlights the lack of high-quality evidence optimizing outcomes in peripheral artery disease and emphasizes the need to develop rigorous clinical trials to close this knowledge gap.

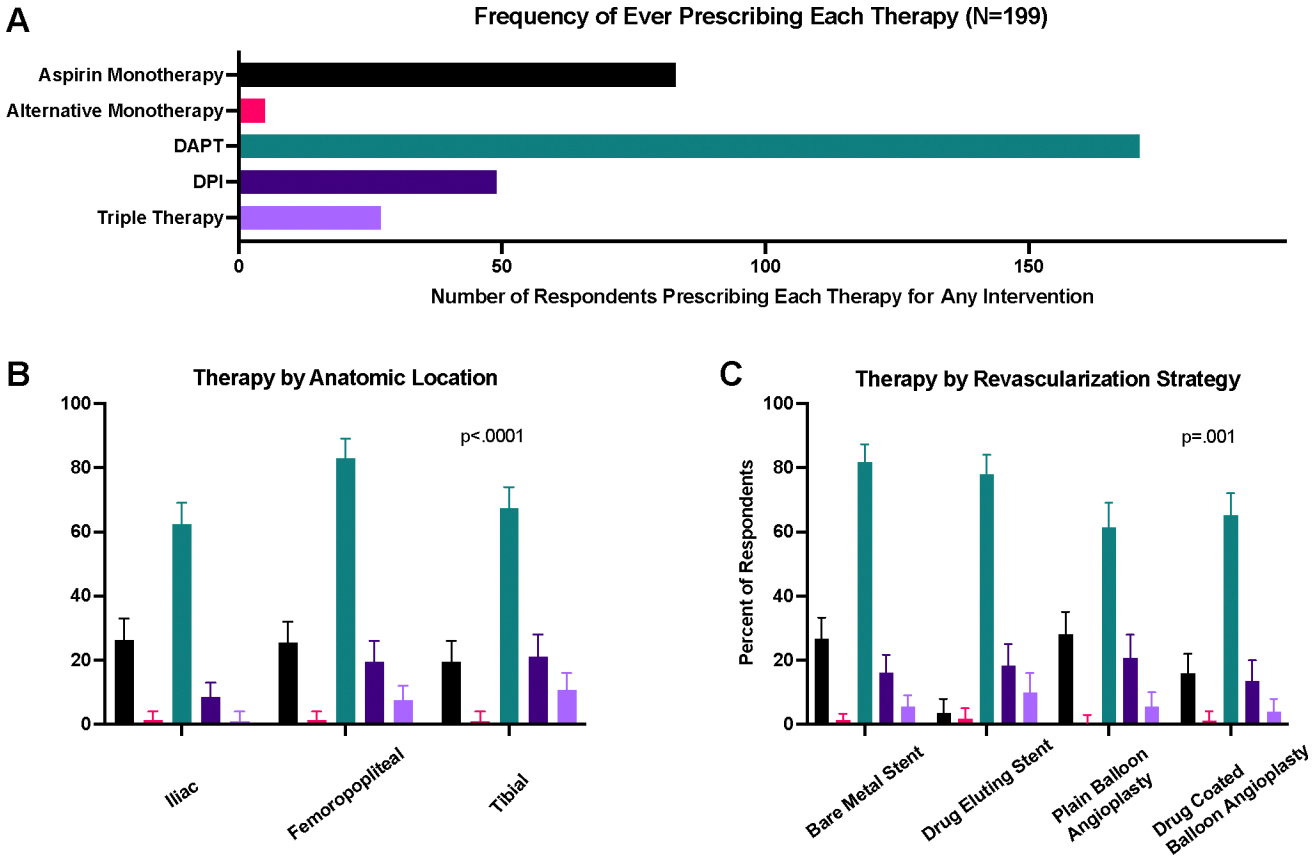

Fig 1.

Respondent medication choice stratified by anatomic location and revascularization strategy of intervention. Throughout the figure, *black* indicates aspirin monotherapy, *fuchsia* indicates alterative monotherapies (prescription of P2Y12 inhibitor [ie, clopidogrel, ticagrelor, or prasugrel] without aspirin or low-dose rivaroxaban without aspirin), *teal* represents dual anti-platelet therapy (*DAPT*), *dark purple* indicates dual pathway inhibition (*DPI*), and *lilac* indicates triple therapy (aspirin, P2Y12 inhibitors, and low-dose rivaroxaban). **A,** Frequency at which a respondent ever prescribed each therapy. **B,** Percentage of therapies prescribed by revascularization strategy (bare metal stenting [BMS], drug-eluting stenting [DES], plain balloon angioplasty, and drug-coated balloon angioplasty). **C,** Percentage of therapies prescribed by anatomic location (iliac, femoropopliteal, and tibial) with 95% confidence intervals.

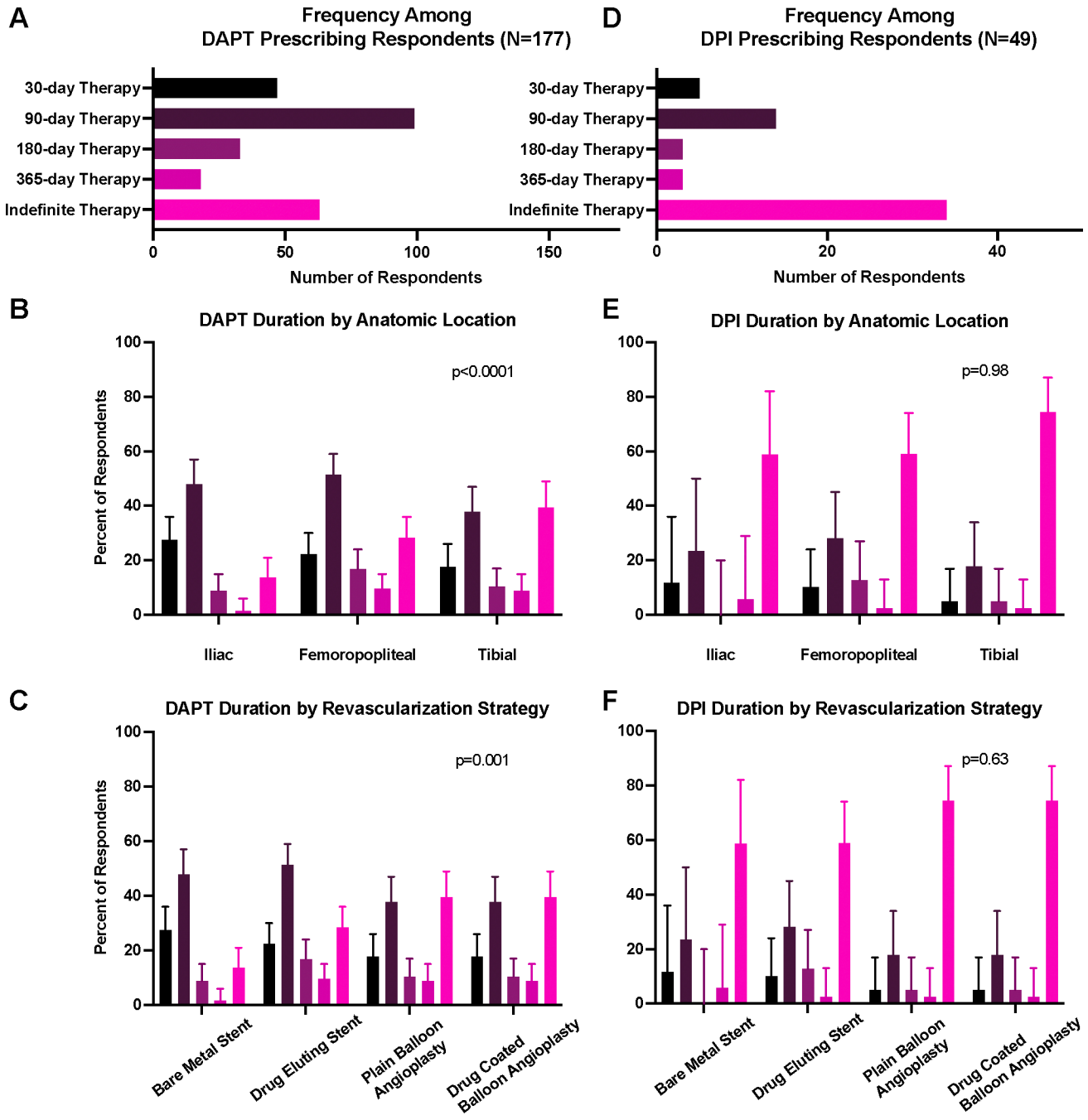

Fig 2.

Respondent dual antiplatelet therapy (*DAPT*) and dual pathway inhibition (*DPI*) duration stratified by anatomic location and revascularization strategy of intervention. Throughout the panel, from darkest to lightest, the colors indicate 30-day, 90-day, 180-day, 365-day, and indefinite therapy. **A,** Frequency respondent prescribed therapy durations among those ever-prescribing DAPT. **B,** Percent at which a respondent prescribed DAPT durations by anatomic location. **C,** Percent at which a respondent prescribed DAPT durations by revascularization strategy. **D,** Frequency at which a respondent prescribed therapy durations

among those ever-prescribing DPI. **E,** Percent at which a respondent prescribed DPI durations by anatomic location. **F,** Percent at which a respondent prescribed DPI durations by revascularization strategy.

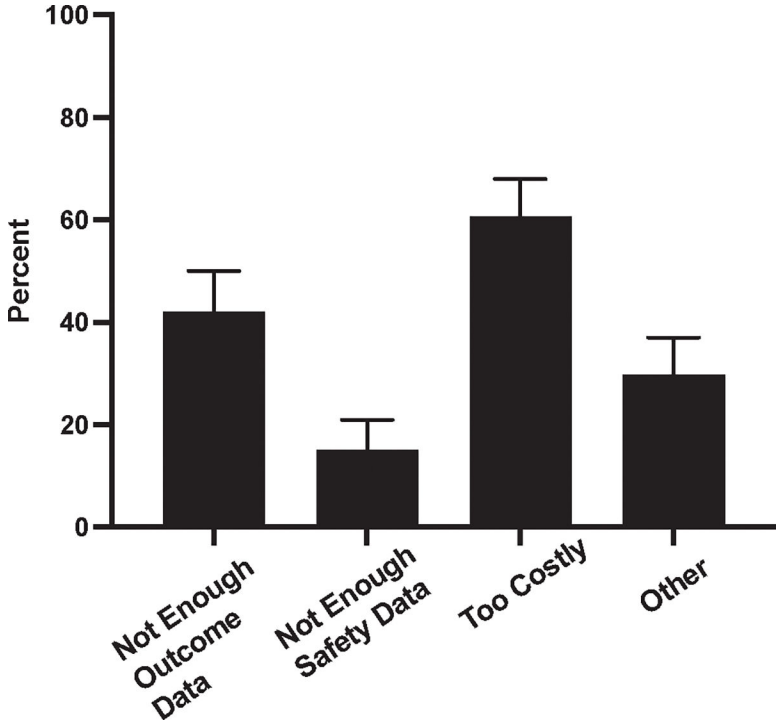

Fig 3.

Respondent reasoning for low-dose rivaroxaban omission. Respondents who never selected low-dose rivaroxaban as a treatment strategy throughout any intervention type and anatomic location. Respondents were asked to select all answers that apply.

Table.

Baseline characteristics of survey respondents

Demographics	Total n = 199	Antiplatelet therapy n = 150	DPI n = 49	*P* value
Gender				.69
Female	29 (17)	24 (19)	5 (13)	
Male	135 (81)	101 (80)	34 (87)	
Non-binary	2 (1)	2 (2)	0 (0)	
Race				.45
White	119 (78)	92 (79)	27 (75)	
American Indian/Alaskan Native	1 (1)	1 (1)	0 (0)	
Black	1 (1)	1 (1)	0 (0)	
Asian	28 (18)	21 (18)	7 (19)	
Mixed race	3 (2)	1 (1)	2 (6)	
Ethnicity				.70
Hispanic origin	10 (7)	7 (6)	3 (8)	
Non-Hispanic origin	141 (93)	108 (94)	33 (92)	
Practice specialty				.038
Interventionalist[a]	12 (7)	6 (4)	6 (14)	
Surgeon[b]	164 (93)	128 (96)	36 (86)	
Practice years				1.00
<20	74 (45)	57 (45)	17 (45)	
20+	91 (55)	70 (55)	21 (55)	
Practice type				.34
Academic/university based — rural	19 (11)	17 (13)	2 (5)	
Academic/university based — urban	92 (52)	66 (49)	26 (62)	
Community/private practice — rural	19 (11)	14 (10)	5 (12)	
Community/private practice — urban	46 (26)	37 (28)	9 (21)	
Practice region[c]				.019
Northeast	49 (28)	44 (33)	5 (12)	

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Demographics	Total n = 199	Antiplatelet therapy n = 150	DPI n = 49	*P* value
Southeast	36 (20)	27 (20)	9 (21)	
Midwest	26 (15)	21 (16)	5 (12)	
Southwest	13 (7)	10 (7)	3 (7)	
West	36 (20)	24 (18)	12 (29)	
Outside United States	16 (9)	8 (6)	8 (19)	
Practice procedures per month				.60
<10	88 (50)	69 (51)	19 (45)	
10+	88 (50)	65 (49)	23 (55)	

DPI, Dual pathway inhibition.

Data are presented as number (%).

[a]Cardiology (n = 9 [5%]), radiology (n = 9 [5%]).

[b]Cardiothoracic (n = 1 [1%]), vascular (n = 154 [88%]).

[b]Northeast: Connecticut, Massachusetts, Maine, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont. Southeast: Alabama, Kentucky, Minnesota, Tennessee, Delaware, Florida, Georgia, Maryland, DC, North Carolina, South Carolina, West Virginia, Virginia. Midwest: Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, Wisconsin. Southwest: Arkansas, Oklahoma, Louisiana, Texas. West: Alaska, Arizona, California, Colorado, Hawaii, Idaho, New Mexico, Nevada, Oregon, Washington, Wyoming.