

**Presentation
Number:** KC22

**Publishing
Title:** Expert endovascular performance does not translate to improved performance levels on robotic platforms for novice users

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OBJECTIVES: Endovascular robotics systems, having now been approved for clinical use in the US and Europe, are seeing rapid growth in interest. As yet, determining who has sufficient expertise for safe and effective clinical use remains elusive. Our aim was to analyze performance of novice, intermediate and expert endovascular interventionalists on a robotic platform to determine if expertise in traditional manual techniques translates into improved robotic performance.

METHODS: Over 3 separate sessions, 20 subjects with varying levels of endovascular expertise (novice=9, intermediate=5, expert=6), and with minimal to no experience using an endovascular robot, performed a series of 4 tasks on an endovascular skills model. Prior to initiation of the study, participants were trained to use the robot according to approved guidelines and by a certified instructor. Subjects were given 5 minutes to complete each task. In addition of total time, electromagnetic tracking of the catheter tip was performed to capture metrics of smoothness and efficiency. Data from 2 expert users with >100 hours experience on the robotic system also completed 3 sessions each, in order to provide a gold standard for robotic expertise.

RESULTS: The tasks were successfully completed 93.75% of the time (92% for novices, 94% by intermediates and 96% by experts). There was no significant difference in completion times for the 3 groups of novice robot users, and for all groups there was a wide standard deviation in completion times. There was also wide variability in performance of users between sessions for all inexperienced users of the robot. The expert robotic user had shorter completion times, more efficient catheter motion, and times were more consistent between sessions. (Table 1)

CONCLUSIONS: Expertise in performance of traditional manual endovascular interventions does not translate to performance on the endovascular robot. Simulation task completion times, efficiency of catheter movement and consistency of performance on the robot may help identify those users who are sufficiently trained for safe clinical use of the system.

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Experience Level	Task 1 Median time(s) (Std Dev)	Task 2 Median time(s) (Std Dev)	Task 3 Median time(s) (Std Dev)	Task 4 Median time(s) (Std Dev)
Novice	70(83)	82(60)	194(86)	75(62)
Intermediate	51(61)	85.5(79)	186(57)	74(45)
Expert	84(40)	91(71)	185(66)	79(31)
Expert robot	43(10)	49(7)	114(19)	47(3)

**Presentation
Number:** KC23

**Publishing
Title:** Community - Based Walking Exercise Intervention in Hispanic patients with Peripheral Arterial Disease (PAD) - Randomized Controlled Clinical Trial

**Author
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Community – Based Walking Exercise Intervention in Hispanic patients with Peripheral Arterial Disease (PAD) – Randomized Controlled Clinical Trial

OBJECTIVE: To determine whether a community-based walking exercise program that uses a group-mediated risk modification intervention, can improve functional performance compared to usual care and unsupervised control group in patients with PAD with and without intermittent claudication.

METHODS: Randomized controlled clinical trial of 53 Hispanic patients with PAD was performed in Dallas, Texas during a 12-month period. Participants were randomized to 1 of 2 parallel groups: community-based walking exercise intervention or usual care unsupervised control group. The primary outcome was 6-month change in 6-minute walk performance. Secondary outcomes included 6-month change in 4-meter walking velocity and muscle power balance.

RESULTS: Participants randomized to both groups had a decline in their performance in the 6 minute walk test (reported in meters): intervention group, 357.3 (IQR 316.2–405.7) to 342 (IQR 301.8–396.3); control group, 286.5 m (IQR 224–397.8) to 268.5 (IQR 202–368). Median difference was -16.4 meters for the intervention group ($P=0.2$) and -15.05 meters for the control group ($P=0.5$). In the 4-meter walking velocity test, patients from both groups had a decrease in the walking speed: intervention group, 1.06 to 0.84 m/s ($p=0.05$); control group, 0.85 to 0.77 m/s ($p=0.05$). Patients in both groups required more time to complete the muscle balance test (intervention, 11.6 to 13.15 seconds [$p=0.06$]; control, 12.95 to 13.55 seconds [$p=0.2$]).

CONCLUSION: A community- based walking exercise program did not improve walking distance, endurance and walking speed in Hispanic patients with PAD with and without claudication symptoms. Future studies are required to evaluate the effectiveness of alternative non-Hospital based exercise programs in patients with PAD, especially for patients from ethnic minorities.

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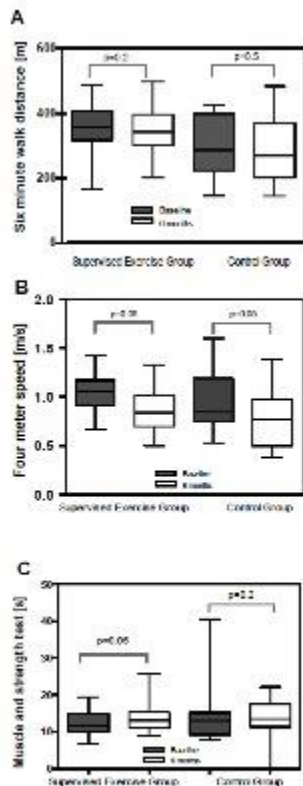


Fig. 1 Changes in Functional outcome performance tests. A. Six minute walk test. B. Four meter speed test. C. Muscle strength and balance test.

**Presentation
Number:** KC24

**Publishing
Title:** Implementation of best medical therapy for cardiovascular risk factors in vascular surgery patients

**Author
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OBJECTIVES: Current clinical evidence reports that antiplatelet, statin, angiotensin converting enzyme inhibitor and beta blockade therapies have advantageous effects on vascular surgery patient morbidity and mortality. Unfortunately, such patients appear to be less likely to receive optimal medical management when compared to coronary artery disease patients. This study assessed medical therapy prescribing in patients attending a regional vascular surgery unit.

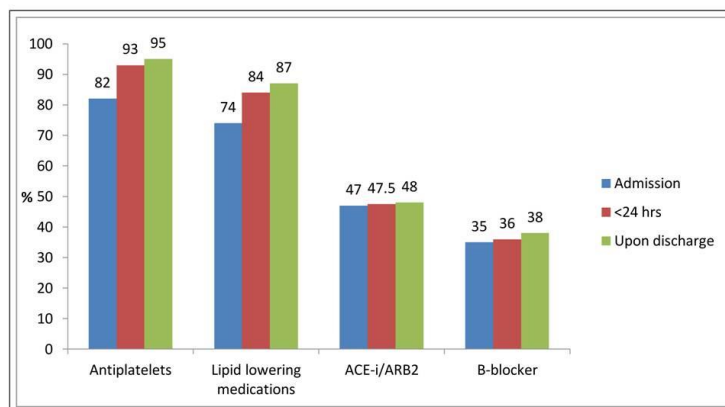
METHODS: A retrospective review between February 2010 and February 2011 was performed for patients undergoing aortic aneurysm, carotid, peripheral arterial and amputation surgeries. Gender, age, smoking history, body mass index and cardiovascular risk factors were documented from inpatient charts. Current admission medications and subsequent modification by the vascular team were recorded.

RESULTS: Two hundred and forty-four patients (male=165, mean age=71 years) were identified. Prevalence of hypertension, hypercholesterolemia, myocardial infarction, angina, stroke and diabetes were significantly higher than in the general age-matched population. 201 (82.3%) patients were on antiplatelet or antithrombotic medication upon admission to the vascular ward which was improved to 231 (94.6%) patients on discharge. 180 (73.7%) patients were on lipid lowering therapy upon admission which improved to 213 (87.2%) patients on discharge. A total of 115 (47.1%) patients were on ACE-inhibitor or angiotensin 2 receptor blocker medications on admission and this was improved to 118 (48.3%) upon discharge. 87 (35.6%) patients were on a beta blocker which improved to 93 (38.1%) patients upon discharge.

CONCLUSIONS: Implementation of best medical therapy is widely adopted in the community with compliance rates greater than 73% for aspirin and statin therapy. Vascular surgeons should remain vigilant for further opportunities to optimise medical therapy in this high risk patient group particularly in antithrombotic, lipid lowering and antihypertensive therapies.

Figure 1: Medication demographics with percentage of patients prescribed antiplatelet, lipid lowering, angiotensin converting enzyme inhibitors / receptor blockers and beta-blocker therapies on admission, within 24-hours of admission and within 24-hours prior to discharge (n=244).

**Abstract
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**Presentation
Number:** KC25

**Publishing
Title:** Chronic Mesenteric Ischemia as a pre-procedural risk factor

Author Block: **Jordan Knepper, MD, MSc**, Nicholas Osborne, MD, MSc, Peter Henke, MD, Tina Chen, MD, Dawn Coleman, MD, Danielle Horne, MD, MS, John Rectenwald, MD, Katherine Gallagher, MD.

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SCVC Abstract

Introduction: The recognition of chronic mesenteric ischemia (CMI) is increasing in clinical practice. Although this diagnosis has long been associated with high mortality rates, surprisingly little is known about the influence of CMI on outcomes following treatment of other common vascular disease processes (i.e., PAD, CAS, UE disease). This study examines the outcomes following endovascular therapy for non-mesenteric vascular disease in CMI patients previously treated with endovascular therapy.

Methods: A prospective Blue Cross Blue Shield Registry for patients in the State of Michigan was queried for all patients with CMI who underwent endovascular therapy (PTA or stent) from 2005 to 2011. Patients with acute or acute on chronic mesenteric ischemia were excluded from the study. Demographics, perioperative data and morbidity/mortality data were extracted and statistically evaluated using modeling and multivariable analyses.

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Results: 15974 patient's records were evaluated and analyzed. Of those, 474 patients underwent endovascular intervention for CMI. Endovascular therapy for these patients included stents in 60% and PTA alone in 40%. The average age was 67 +/- 10 years, with 67% of the patients being female. Comorbidities were assessed and were adequately matched, including CAD, smoking and PAD. 30-day mortality rates for patients with CMI/endovascular intervention who were undergoing non-mesenteric endovascular interventions were 3.85% compared to 1.15% in those patients without endovascular treated CMI undergoing non-mesenteric endovascular interventions. (P<.001) At 6 months, these differences between the groups remain significantly different (4.17% vs. 3.4%; P<.001).

Conclusions: As CMI has been diagnosed with increased frequency and commonly occurs with vascular disease in other vascular territories, it appears that CMI, is an independent pre-operative risk factor for endovascular treatment of all non-mesenteric vascular disease and should be considered, based on our results, as a CAD equivalent in terms of risk stratification.

**Presentation
Number:** KC26

**Publishing
Title:** Treating Peripheral Vascular Disease in the Era of Morbid Obesity

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Objective: The rising incidence of morbid obesity is especially relevant to vascular surgeons. The purpose of this study was to compare morbidly obese patients with the general population for rates of revascularization in the setting of peripheral vascular disease (PVD) and identify comorbidities and demographic variables related to morbid obesity within this population.

Methods: The Nationwide Inpatient Sample database was used to identify hospitalizations associated with PVD from 2005-2009. Rates of percutaneous and open revascularization were compared between morbidly obese and non-morbidly obese patients. For patients undergoing revascularization, multivariate logistic regression was used to identify variables independently associated with morbid obesity. Post-procedure complications were analyzed, and subgroup analysis was performed for specific complications of PVD, including claudication, rest pain, ulceration and gangrene.

Results: During the study period there were 600,799 hospital admissions during which a revascularization procedure was performed for PVD. Morbidly obese patients within this group were significantly younger (median age 57 y.o. vs. 65 y.o., $p<0.0005$). Multivariate logistic regression identified variables independently associated with morbid obesity, including diabetes (OR 3.94-4.30), congestive heart failure (OR 2.15-3.10), chronic kidney disease (OR 1.19-1.36), Caucasian race (OR 1.08-1.17) and lowest income quartile (OR 1.05-1.15). Negatively associated variables with morbid obesity include age over 60 (OR 0.40-0.44), smoking (OR 0.78-0.88), coronary artery disease (OR 0.75-0.83), highest income quartile (OR 0.84-0.94), and public insurance (OR 0.72-0.79).

Morbidly obese patients with rest pain or claudication were less likely to undergo revascularization procedures (68.1% vs. 72.3%, $p<0.0005$ and 58.4% vs. 60.9%, $p<0.0005$). They had higher rates of wound complications and infections for both percutaneous and open approaches. Finally, morbidly obese patients with ulceration or gangrene were less likely to undergo amputation compared to non-morbidly obese patients (8.9% vs. 16.5%, $p<0.0005$).

Conclusions: The morbidly obese population requires intervention for PVD at a younger age than the general population, independent of other comorbidities including diabetes. However, they are less likely to undergo revascularization and are half as likely to undergo major amputation. Those undergoing revascularization have significant differences from the general population with regards to age, medical comorbidities, and household income. Further study is warranted to determine the cause of these disparities.

**Abstract
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**Presentation
Number:** KC27

**Publishing
Title:** Vascular Surgeons' Management of Venous Disease in Canada: Results of a National Survey

Author Block: **Douglas Wooster, MD, FRCSC, FACS, RPVI¹**, Elisa F. Greco, MD, Vascular Resident¹, Sidney Wong, MD, Vascular Resident¹, Elizabeth Wooster, M.Ed., PhD Candidate².

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OBJECTIVES: Venous disease is the most common vascular issue encountered in the community. Vascular surgeons' (VS) involvement in venous management varies across Canada, but it can represent a large component of practice. Trainee involvement in the management of venous disease is often limited. With the publication of venous guidelines, interest in venous management from generalists and other specialists, advances in endovenous interventions, and changes in payor (government) policies, the role of VS in the management of venous disease needs attention. We sought to obtain an overview of practice patterns and attitudes towards venous disease management by VS in Canada.

METHODS: A detailed electronic survey was developed similar to published surveys from other countries and sent to practicing VS in Canada. The data was collated and compared to reports from elsewhere to develop a comparative management map for VS management of venous disease.

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RESULTS: 82% of respondents were in general vascular practice, while 9% confined their practice to a venous clinic. Venous disease represented between 1 and 25% of practice for 73% of VS. The indications for consultation most commonly seen were: venous ulcer (100%), SVT (82%), and leg swelling (82%). Most (55%) noted an increase in referrals over the last 5 years. 82% of VS state they follow CHEST guidelines for venous disease management; however, they treat SVT with Duplex and selective treatment (64%) or symptomatically (36%). VS believe that primary care physicians (80%) and other specialists (33%) do not understand venous disease well.

Specific training in venous issues was poorly represented in residency training, with poor exposure to support stocking use (60%), sclerotherapy (30%), EV ablation (20%), and IVC filters (11%). Venous-oriented continuing medical education (CME) represents at component of CME for 67% of VS.

CONCLUSIONS: Despite limited venous training during residency, a large proportion of Canadian VS are involved in venous practice. Most VS state that they incorporate guidelines into their practice. Venous-oriented CME is pursued by most VS in Canada. More detailed data is required to allow comparison to venous practice in other countries and to more fully understand training priorities.