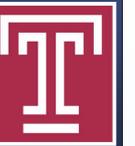


# Knowledge and Perception of Vascular Medicine Among Podiatric Medical Students

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## Statement of Purpose and Literature Review

Diabetic limb salvage has become a large niche within podiatric medicine and surgery, and considering the aging population across the US, it has become more demanding of surgeons' time, effort, and activity [1]. To truly understand diabetic limb preservation, it is important to have a comprehensive understanding of vascular pathology. Podiatric and vascular surgeons necessitate a mutual understanding of each other's role in preservation of a patient's limb, and to do so effectively, this understanding stems from the fundamentals of vascular education from both medical school and residency.

**The purpose of the present study was to evaluate the state of vascular education and knowledge among podiatric medical students.**

## Methodology

A comprehensive 34-part questionnaire was distributed to both third- and fourth-year podiatric medical students at the Temple University School of Podiatric Medicine.

Previously published questionnaires and surveys were utilized as a guide to compile our specific vascular education student survey [2-7].

The survey included 29 academic questions pertaining to vascular surgery, as well as a survey. This also involved a practical portion which assessed the students' ability to appropriately calculate an ankle/brachial index (ABI).

Answers were tabulated and scored as a percentage. A total of 30 third year podiatric students and 20 fourth year podiatric students completed the survey, totaling 50 completed surveys for final data analysis.

## Results

Three questions pertained to "vascular disease prevalence" and had a correct response rate ranging between 12-36% (mean: 26.7%). Five questions pertained to "screening for vascular disease" and had an overall correct response rate ranging between 8-96% (mean: 46.0%). Eight questions pertained to "treatment" questions and had an overall correct response rate ranging between 20-62% (mean: 35.8%). The overall correct response rate for this group of questions was 37.4% (Table 1).

Six questions pertained to "interpretation" of the ABI and had a correct response rate ranging from 6-100% (mean: 73.3%). The largest error with interpreting the ankle-brachial index was when the value was greater than 1.0, in which 94% of students answered incorrectly. Understanding of ankle-brachial index measurements had an overall correct response rate of 10%. Calculating ABI results had an overall correct response rate of 58% (Table 2).

Table 3 explores where the most common error occurred during ABI calculation. 30% of students selected the lowest pedal pressure, 16% of students selected the lower brachial pressure, and 24% of the students divided the brachial pressure by the pedal pressure.

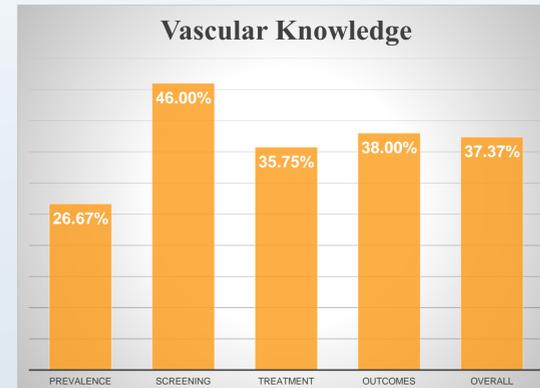


Table 1: Graphical illustration of percentage of correct response for vascular disease prevalence, screening, treatment, and outcomes.

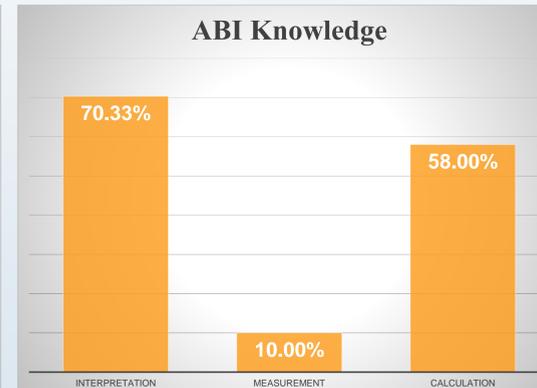


Table 2: Graphical illustration of percentage of correct response for ankle-brachial index interpretation, measurement, and calculation knowledge.

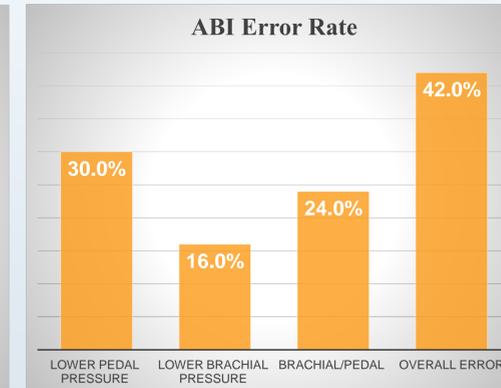


Table 3: Graphical illustration of most common error when performing ankle-brachial index calculations.

When comparing third- and fourth-year podiatric students with vascular knowledge, fourth year podiatric students scored subjectively higher with respect to vascular disease prevalence (45% v. 14%), screening (48% v. 45%), and treatment (39% v. 33%). Third year students scored subjectively higher with outcomes (39% v. 37%), but overall knowledge was a mean of 42% as seen in Table 4. When equating ABI knowledge, third year students scored subjectively higher with respect to ABI interpretation (71% v. 69%) and calculation (82% v. 73%) but both years scored relatively low with respect to ABI measurement (Table 5). Finally, with ABI calculation error rate, overall fourth year podiatric students had a subjectively higher error rate as compared to third year podiatric students (45% v. 40%).

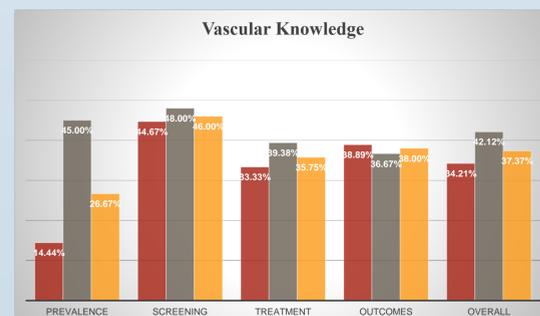


Table 4: Graphical illustration of percentage of correct response for prevalence, screening, treatment, and outcomes between third-year podiatric students (red), fourth-year podiatric students (grey), and overall scores (yellow).

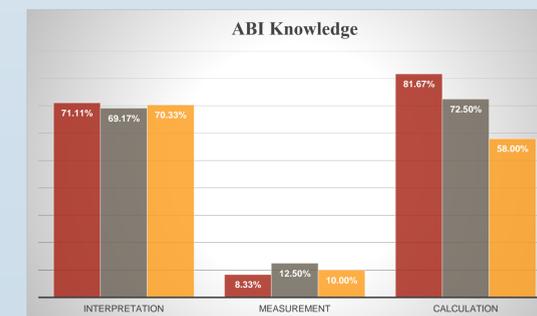


Table 5: Graphical illustration of percentage of correct response for ankle-brachial index interpretation, measurement, and calculation knowledge, comparing third- and fourth-year students.

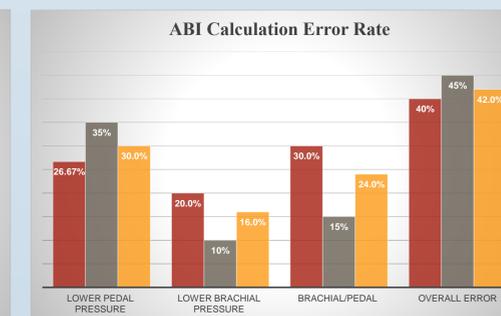


Table 6: Graphical illustration of most common error when performing ankle-brachial index calculations, comparing third- and fourth-year podiatric students.

## Discussion

To progress and improve the quality of patient care, the state of vascular education among podiatric students' might require improvement. These results indicate that this might be best performed at the foundational level in podiatric medical school.

A previous study performed by Schwartz et. al evaluated internal medicine residents' knowledge of vascular surgery [2]. Comparing podiatric medical students to internal medicine residents, prevalence (26.7% versus 48.9%), treatment (35.8% versus 45.0%), and outcomes (38.0% versus 42.5%) were all lower among the podiatric students. When it came to screening peripheral vascular disease, podiatric students had a higher percentage of correct answers compared to internal medicine residents (46.0% versus 33.8%). Overall, podiatric students had a lower percentage of correct answers compared to internal medicine residents (37.4% versus 41.7%).

Overall 28% of students felt adequately trained and 88% of students stated they would like more formal training in performing ABI's. Interestingly, when comparing 3<sup>rd</sup> year to 4<sup>th</sup> year podiatric medical students the "felt adequately trained" percentage rose from 16.7% to 45.0%, respectively. Likewise, when comparing "wanting more formal training" the percentage declined from 93.3% to 80.0%, respectively. However, these results might be expected, as one gets more clinical experience one gets more confident.

In conclusion, the results of this investigation indicate that vascular education within podiatric medicine and surgery might benefit from some improvement.

## References

- [1] Armstrong, David G., et al. "A heads-up display for diabetic limb salvage surgery: a view through the google looking glass." *Journal of diabetes science and technology* 8.5 (2014): 951-956.
- [2] Schwarcz AI, Quijano A, Olin JW, Ostfeld RJ. Internal Medicine Interns Have a Poor Knowledge of Peripheral Artery Disease. *Angiology*. 2012. 63 (8), 597-602.
- [3] Georgakarakos E, Georgiadis GS, Christopoulos DC, Lazarides MK. Vascular Educational Needs in the "Real World" and Teaching of Vascular Surgery in Medical Schools: Evidence and Suggestions. *Angiology*. 2017; 68 (2), 93-95.
- [4] Georgakarakos E, Papdaki E, Vamvakarou V, Lytras D, Tsiokani A, Tzolaki O, Chlmpou D, Papanas N. Training to Measure Ankle-Brachial Index at the Undergraduate Level: Can It Be Successful? *The International Journal of Lower Extremity Wounds*. 2013; 12 (2), 167-171.
- [5] Wyatt MF, Stickrath C, Shah A, Smart A, Hunt J, Casserly IP. Ankle-brachial index performance among internal medicine residents. *Vascular Medicine*. 2010. 15(2), 99-105.
- [6] Chaudru S, de-Mullenheim PY, Faucheur AL, Jaquinandi V, Kaladji A, Mahe G. Knowledge about ankle-brachial index procedure among residents: being experienced is beneficial but is not enough. *Vasa*. 2016. 45 (1), 37-41.
- [7] Campbell WB, Aitken M, Tooke JE. Expectations for the Skills of Final Year Medical Students in Examining Lower Limb Arteries and Veins. *Eur J Vasc Endovasc Surg*. March 2002. 23, 270-271