**Objectives:** Endovascular treatment of thoracic aortic arch pathology often requires coverage of aortic branch vessels for adequate proximal seal. Historically, revascularization was performed with aortic debranching, but new endovascular devices have provided options with regards to the optimal management. This study sought to examine our center's experience with the Gore TAG Thoracic Branch Endoprosthesis (TBE) endovascular revascularization of aortic branch vessels.

**Methods:** A retrospective cohort of all patients who received a Gore TAG TBE at our center was included. Demographics, aortic characteristics, and 30-day outcomes were collected.

**Results:** Thirty-three patients were included in our study with a median age of 72 years (interquartile range, 13.5 years). The majority were male (60.6%; n = 20). Basic demographics can be found in Table. Eight patients (24.4%) had previous proximal aortic surgery. The most common indication for treatment was aneurysmal disease (n = 12; 36%) followed by penetrating aortic ulcer (n = 9; 27%). Deployments were performed in zone 2, zone 1, and zone 0 in 23, 7, and 3 cases, respectively. Twelve patients had concomitant or preoperative debranching performed to facilitate a proximal landing zone. There were two (6%) documented cerebrovascular accidents postoperative and five (15%) access site complications. Seven patients had endoleaks present on their pre-discharge computed tomography scan. Three patients required reoperation within 30 days, one each for branch vessel occlusion, proximal endoleak, and limb ischemia secondary to iliac stent occlusion.

**Conclusions:** This study examined the largest cohort of patients in Canada treated with Gore TAG TBE for thoracic aortic pathology and found favorable short-term results with one-third of deployments in zone 1 or zone 0. The two patients with postoperative neurologic deficits had full resolution of symptoms prior to discharge, and branch vessel patency was 97%. Further research is required to clarify which patient and anatomic characteristics benefit most from thoracic branch endografting.

**Table.** XXX

| Characteristics | Data |
|---|---|
| Demographics | |
| Age | 72 (13.5) |
| Male | 20 (60.6) |
| Hypertension | 25 (75.8) |
| Dyslipidemia | 18 (54.5) |
| Coronary artery disease | 10 (30.3) |
| Smoking history | 16 (48.5) |
| Current | 7 (21.2) |
| Prior | 9 (27.3) |
| Operative characteristics | |
| Previous proximal aortic surgery | 8 (24.2) |
| Indication for intervention | |
| Aneurysmal disease | 12 (36.4) |
| Penetrating aortic ulcer | 9 (27.3) |
| Acute aortic dissection | 4 (12.1) |
| Chronic aortic dissection | 4 (12.1) |
| Blunt thoracic aortic injury | 2 (6.1) |
| Komerrell's diverticulum | 1 (3.0) |
| Subclavian artery aneurysm | 1 (3.0) |
| Deployment zone | |
| Zone 0 | 3 (9.1) |
| Zone 1 | 7 (21.2) |
| Zone 2 | 23 (69.7) |
| Adjunctive debranching | 12 (36.4) |
| Staged preoperative | 6 (18.2) |
| Concomitant | 6 (18.2) |
| Postoperative outcomes | |
| ICU length of stay | 1 (2) |
| Hospital length of stay | 3 (3) |
| Cerebrovascular accident | 2 (6.1) |
| Access complications | 5 (15.2) |
| Branch primary patency | 32 (97.0) |
| Endoleaks | 7 (21.2) |
| Type 1A | 2 |
| Type 1B | 1 |
| Type 2 | 3 |
| Type 3 | 1 |
| Reoperations | 3 (9.1) |

*ICU*, Intensive care unit.
Data are presented as number (%) or median (interquartile range).

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## 10_CSVS_2025

### Evaluating Vascularis, A Modular Retrieval-augmented Generation-based Vascular Surgery Artificial Intelligence Chat Interface, Against General Purpose Large Language Models in Management of Complex Aortic Disease

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**Objective:** The aim of this study was to compare the clinical decision-making performance of Vascularis (VASC.AI), a vascular surgery-specific artificial intelligence (AI) using Modular Retrieval-augmented Generation (modular RAG), against a standard RAG model and general-purpose large language models (ChatGPT-4.0, Gemini, and Copilot) in management of complex aortic pathologies.

**Methods:** Using the AI-ASCEND Benchmark, 35 standardized complex aortic scenarios were evaluated across five domains: diagnostic accuracy, workup thoroughness, clarity in medical optimization, treatment relevance, and overall usefulness. Responses were graded by three vascular surgeons (scale 1–5). One-way ANOVA and pairwise *t*-tests determined significance. Architectural differences between models (Fig 1) and performance outcomes (Fig 2) were systematically analyzed.

**Results:** Vascularis (modular RAG) significantly outperformed standard RAG ($P = .0036$) and all general-purpose models ($P < .0001$) across all domains. In Fig 2, A, modular RAG achieved the highest overall benchmark score, with a mean overall usefulness of 4.94 ± 0.24 ($P < .0001$ vs all other models) (Fig 2, B). Diagnostic accuracy (4.97 ± 0.17) (Fig 2, C) was significantly higher than Gemini (4.10 ± 0.30; $P < .0001$) and Copilot (4.30 ± 0.35; $P = .0024$), with parity to standard RAG ($P = .85$) and non-significant difference with ChatGPT-4.0 ($P = .122$). Vascularis's thoroughness of workup (4.97 ± 0.16) (Fig 2, D) and clarity in medical optimization (4.94 ± 0.24) (Fig 2, E) exceeded all comparators ($P < .05$), demonstrating

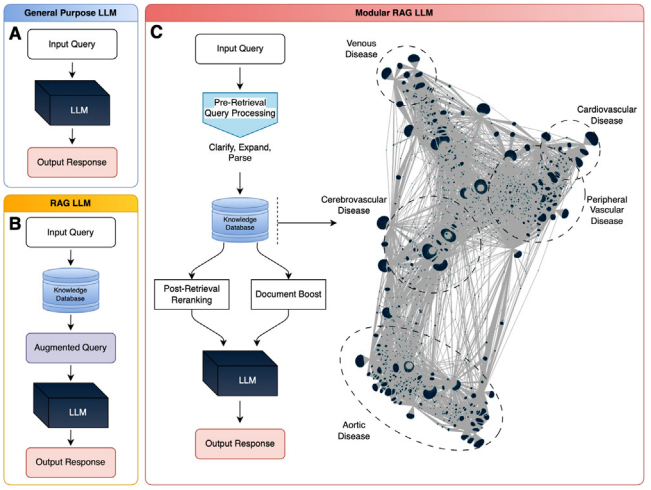


**Fig 1.** Overview of general purpose, Retrieval-augmented Generation (RAG), and modular RAG large language model (LLM) architectures for clinical decision support in vascular surgery. **(A)** In a general-purpose LLM, user queries are directly processed by the LLM without external knowledge retrieval, relying solely on internal training data. **(B)** RAG models improve accuracy by retrieving domain-specific documents, augmenting the original query, and then generating a response based on both inputs. **(C)** The Modular RAG LLM architecture, used in Vascularis (VASC.AI), introduces multiple enhancements: pre-retrieval query processing (clarifying, expanding, and parsing queries), dynamic document retrieval with knowledge-specific boosting (favoring clinical guidelines and peer-reviewed abstracts), and post-retrieval reranking. The right side visualizes the interconnected structure of the knowledge database, demonstrating document clustering by disease category (eg, venous disease, cardiovascular disease, peripheral vascular disease, cerebrovascular disease, and aortic disease), optimizing precise and context-aware response generation.

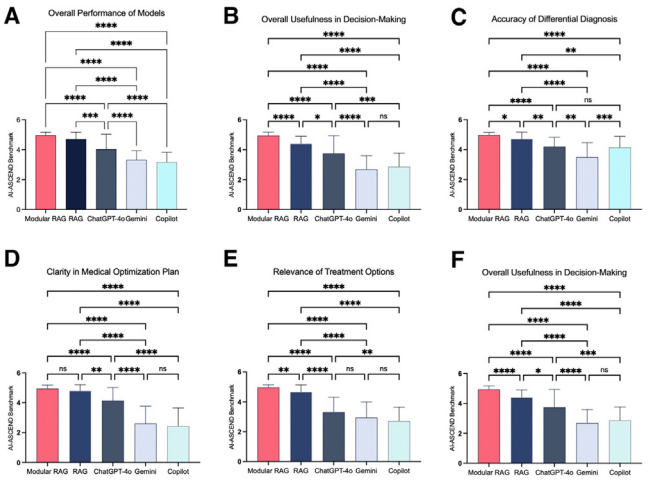


**Fig 2.** Overall and section-specific performance of artificial intelligence (AI) platforms. Overall and section-specific performance of Vascularis (Modular RAG), Standard RAG, ChatGPT-4o, Gemini, and Copilot in clinical scenarios involving complex aortic pathologies, as assessed by the AI-ASCEND Benchmark. Subpanels depict **(A)** Overall Performance of Models, **(B)** Accuracy of Differential Diagnosis, **(C)** Thoroughness of Workup Suggestions, **(D)** Clarity in Medical Optimization Plan, **(E)** Relevance of Treatment Options, and **(F)** Overall Usefulness in Decision-Making. Values are presented as means ± standard deviation. Data were analyzed using one-way analysis of variance (ANOVA) followed by post hoc pairwise *t*-tests. *$P < .05$; **$P < .01$; ***$P < .001$; ****$P < .0001$; ns = not significant.

superiority not only in knowledge retrieval but also structured clinical reasoning. Relevance of treatment options (4.97 ± 0.17) (Fig 2, F) was highest with modular RAG ($P < .0001$ vs all general models). These findings reflect the impact of modular design, specifically pre-retrieval query processing and post-retrieval reranking strategies.

**Conclusions:** Vascularis demonstrated significantly superior performance in complex aortic management, as its architecture enables accurate, evidence-based, and context-specific recommendations, emphasizing the critical role of specialized AI in improving vascular surgery decision-making, education, and equitable care delivery.

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## SESSION III: DIVERSITY, EQUITY AND INCLUSION

### 11_CSVS_2025

### Trainee Perceptions of Equity, Diversity, and Inclusion Within Canadian Vascular Surgery Training Programs

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**Objective:** The aim of this study was to gain insight into Canadian vascular surgery resident perceptions of diversity, equity, and inclusion (DEI) within their surgical training programs.

**Methods:** An anonymous online survey was distributed to all Canadian vascular surgery trainees in March 2024. The survey included questions surrounding baseline demographics, program diversity, and professional and personal experiences with respect to DEI.

**Results:** The survey received 20 responses (27% of Canadian trainees), of which 45% were men and 55% were women. Respondents had diverse ethnic backgrounds: 60% European, 20% Middle Eastern, 15% East Asian, 10% South Asian, 5% African, and 5% Jewish. The majority of respondents (95%) felt their program included trainees from diverse backgrounds particularly in the areas of age, ethnicity, gender, religion, and rural/urban background. Faculty was reported as diverse by 53% of trainees, with 85% reporting their program was similar or less diverse compared with other programs at their institution. Women were more likely to report feeling their gender negatively influences their professional opportunities (50%

**Table.** Gender and ethnicity survey question results

| Do you feel your gender has influenced the surgical, research or mentorship opportunities provided to you compared to your peers? | All (N = 18) | Male (n = 8) | Female (n = 10) |
|---|---|---|---|
| Positive influence | 3 (17%) | 2 (25%) | 1 (10%) |
| Negative influence | 5 (28%) | 0 (0%) | 5 (50%) |
| No influence | 10 (56%) | 6 (75%) | 4 (40%) |
| Do you feel your **gender** impacts the confidence or trust the following groups have in your medical expertise (select any that apply): | | | |
| | All | Male | Female |
| Positively impact | 8 (40%) | 5 (56%) | 3 (27%) |
| Patients | 5 | 5 | 0 |
| Peers | 4 | 2 | 2 |
| Faculty | 4 | 3 | 1 |
| Nursing | 4 | 4 | 0 |
| Negatively impact | 9 (45%) | 1 (11%) | 8 (73%) |
| Patients | 9 | 1 | 8 |
| Peers | 4 | 1 | 3 |

*(Continued on next page)*