

The research race in medical school: An Atlantic medical student's perspective

Josheil K. Boparai, BSc¹

1. Faculty of Medicine, Memorial University, St. John's, NL, Canada

The pressure to contribute to research begins even before medical school begins. Pre-medical students are often convinced that a research publication offers a critical “one-up” in the competitive admissions process.¹ However, this belief is not universally accurate across Canadian medical schools. For example, compared to other Canadian medical schools, Memorial University of Newfoundland (MUN) adopts a holistic admissions approach which considers academics in addition to other components such as work experience and extracurricular activities including “volunteer work, health-related activities, community involvement, sports activities, and any other activities/information.”² Interestingly, they do not explicitly list research as a required criterion. In contrast, schools such as the University of Toronto emphasize research under their “Scholar” domain, which evaluates applicants based on their “awards, conference presentations, publications and scholarships.”³ It is therefore, unsurprising that research experience may differ among applicants matriculating to different medical schools across Canada. Yet regardless of how they arrive, most quickly learn that medical school is just the beginning and the pressure to publish is far from over. Unfortunately, this pressure may be contributing to research output that presents an opportunity for students to advance their careers without developing a true appreciation for the scientific principles of research and scholarly inquiry, as per the CanMEDs Scholar role. As a result, in this opinion piece, I will explore the factors contributing to this pressure to publish, its impact on the quality and purpose of medical student research and strategies to help shift toward a more meaningful and equitable approach to scholarly work.

After medical school, students match into residency, and depending on the specialty of choice, they may complete fellowships and further studies. The competition is steep and research resumes are believed to make or break a match. According to data from the US National Resident Matching Program, matched students had a higher average number of research abstracts, presentations and publications compared to their unmatched peers across all specialties, with the exception of Pediatrics.⁴ Of note, competitive specialties such as neurological surgery and plastic surgery had more than double the number of abstracts, presentations and publications.⁴ It is important to err on the side of caution with these results as this is just correlation, not causation. Interestingly, an analysis of the CaRMS database from 2013-2019 showed that applicants who engaged in more research activities were less likely to match to their first choice discipline in the first iteration of the match.⁵ Furthermore, the

number of publications did not have a significant impact on the likelihood of matching in the first or second iteration.⁵ This contrast in Canadian and American data can be attributed to differences in the evaluation focus of residency applications between the two countries.^{6,7} According to El Galad et al.,⁸ over 95% of Canadian programs in internal medicine, family medicine, pediatrics, anesthesia, general surgery and psychiatry required or considered scholarly work in their selection process.

Despite this contradiction, the research output from medical students continues to climb. Between 2008 and 2022, the number of publications with medical students as authors has increased from less than 50 to more than 300.⁹ On the surface, this seems admirable and may suggest that medical students are fulfilling the CanMEDS role of a Scholar and contributing to the creation and dissemination of knowledge and practices applicable to health.¹⁰ But a closer look reveals a more complex and less flattering reality.

According to Elliott and Carmody (2023),⁹ the most common types of publications by medical students in PubMed-indexed journals were review articles, cross-sectional studies and case reports, which are arguably less rigorous compared to other types of publications. Alarming, 59.1% have never been cited subsequently.⁹ This statistic raises questions about whether students are producing meaningful science or simply checking boxes.

In essence, we are witnessing a “research arms race” —where quantity is outpacing quality, and the pressure to publish is being driven more by securing a residency spot than by a genuine desire to advance medicine. According to the CanMEDS framework, as Scholars, physicians must contribute to the application, dissemination, translation, and creation of knowledge and practices applicable to health and health care.¹⁰ Research prompts the development of life-long learners with self-directed independent learning skills, critical thinking and writing skills, and an understanding of the scientific method.¹¹ When physicians engage in research, patient outcomes improve because their research is informed by clinically-relevant insights that allows them to make breakthroughs like smallpox vaccines, and immunotherapy for cancer treatments.^{12,13} However, these outcomes are less likely when the process is rushed or transactional. Many medical schools, including MUN, have implemented a mandatory research project as a part of their undergraduate medical curriculum. The purpose of the project is “to learn the basics of conducting research” and does not “mandate

publication.”¹⁴ Yet the hidden curriculum often speaks louder than the formal one.

Forty-three percent of respondents across three medical schools in Ontario agreed that the main reason for participation in research during medical school was to improve their chances of acceptance into a residency program.¹⁵ This sentiment echoes a question posed by Dr. Agrawal, a clinician scientist: “Are we truly driven by passion and good faith in helping patients or are we simply churning out papers after papers for our own interest and greed?”¹⁶ This answer may be yes, given that 2022 data from the US Physician Workforce Data Dashboard reported that research is the major professional activity for only 1.2% of physicians.¹⁷ This begs the question: Are we overemphasizing research as a ticket to residency, when for most, it won’t remain a meaningful part of their medical careers?

There’s no doubt that research is important. Without it, we would not have eradicated polio, understood the neurobiology of schizophrenia or improved stroke outcomes. The benefit of research speaks for itself. However, the issue isn’t whether research matters—but whether we’re creating conditions for it to be meaningful and accessible for all students.

Many students report barriers to conducting research such as a lack of time, limited availability of mentors and under-recognition of their research efforts.¹⁸ In the context of MUN, the shortage of clinician-scientist mentors may be a particularly significant barrier to medical students’ participation in research. Few MUN faculty juggle clinical practice and research and this lack of mentorship may contribute to a lack of interest in scholarly work. However, solutions exist. Studies conducted at Queens University and Stanford University show that increased interaction with research faculty can contribute to increased research engagement among students.^{19–20} Perhaps expanding mentorship opportunities at MUN could help foster research engagement as well. Encouragingly, the Canadian Atlantic Medical Students Association recently launched a regional research database which provides Atlantic medical students with a resource that lists all the research being conducted at various institutions across Atlantic Canada. This grassroots effort could be a step toward rebalancing the system and empowering students from smaller, less well-connected institutions.

Ultimately, we need to ask ourselves: What is the purpose of research in medical education? Is it a tool for personal advancement or a platform for collaborative discovery? According to the CanMeds Scholar role, physicians’ scholarly abilities should “allow them to contribute to the application, dissemination, translation, and creation of knowledge and practice applicable to health and health care.”¹⁰ However, these goals are often forgotten in the race to publish to secure a spot in medical school, residency and beyond. Solutions

such as limiting applicants to list only 3-5 research publications may give students the incentive to prioritize quality over quantity.⁹ Doing this would require addressing some significant barriers to medical student research participation. One that I did not mention previously would be equal opportunity. Depending on the institution and students’ personal networks, research opportunities may be limited particularly at smaller institutions like MUN with fewer research faculty in various specialties of interest. For example, at MUN, there are two surgical specialties offered; general surgery and orthopedic surgery for which research involvement is quite high as listed on the website²¹; but there are no opportunities listed for research in other surgical specialties like cardiac surgery, thoracics, ENT or plastics. As a result, developing a standardized method for student research involvement may help reduce this disparity. Similar to the establishment of the AFMC portal²² by the Canadian Federation of Medical Students and the AFMC Standing Committee on Undergraduate Medical Education for students planning away electives, a portal should be developed to support students navigating research opportunities. In conclusion, research is an integral component to evidence-based practice and its benefits are far-reaching. With systems level changes in admission policies and research opportunities, we can help inspire future physicians to engage in research that is driven by curiosity rather than career advancement.

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