

UTQAP Cyclical Review: Final Assessment Report and Implementation Plan

1. Review Summary

Program Reviewed:	Medical Radiation Sciences, BSc
Unit Offering Program:	Department of Radiation Oncology
Commissioning Officer:	Dean, Temerty Faculty of Medicine
Reviewers (Name, Affiliation):	<ul style="list-style-type: none">• Ms. Susan Fawcett, Director, Radiation Therapy Program, University of Alberta• Dr. Karen Knapp – Associate Professor in Musculoskeletal Imaging and Head of Imaging, University of Exeter
Date of Review Visit:	October 14, 2021 (conducted remotely)
Date Reported to AP&P:	February 16, 2023

Previous UTQAP Review

Date: January 14-16, 2013

Summary of Findings and Recommendations

Significant Program Strengths

- Early inter-professional opportunities for students
- Graduates highly prepared for clinical practice
- Dedicated, committed, and passionate faculty

Opportunities for Program Enhancement

- Strengthening students' identification with the University of Toronto
- Tracking alumni outcomes, specifically those in leadership positions
- Providing students with opportunities to engage in research
- Renewing the Nuclear Medicine curriculum

Current Review: Documentation and Consultation

Documentation Provided to Reviewers

Confirmation/agreement letter; terms of reference; self-study report; faculty CVs; schedule; course descriptions; 2012-13 reviewers' report, Dean's and Chair's Responses and FAR-IP; 2019 accreditation report; Dean's Report 2020; Temerty Faculty of Medicine's Strategic Plan (2018-2023); University of Toronto Towards 2030; University of Toronto Quality Assurance Process.

Consultation Process

The external reviewers met remotely with the following:

1. Acting Dean and Vice Dean, Medical Education, Temerty Faculty of Medicine, University of Toronto
2. Vice Dean, Strategy & Operations, Temerty Faculty of Medicine, University of Toronto
3. Vice Dean, Clinical Affairs, Temerty Faculty of Medicine, University of Toronto
4. Chair, Dept. of Radiation Oncology, Temerty Faculty of Medicine, University of Toronto
5. Vice Chair, Dept. of Radiation Oncology, Temerty Faculty of Medicine, University of Toronto
6. Head, Academic Affairs & Operations, The Michener Institute of Education, University Health Network
7. Chair, Radiation Therapy & MRI, The Michener Institute of Education, University Health Network
8. Principal, School of Applied Health Sciences, The Michener Institute of Education, University Health Network
9. Chair, Imaging, The Michener Institute of Education, University Health Network
10. Director, BScMRS, Dept. of Radiation Oncology, Temerty Faculty of Medicine, University of Toronto
11. Associate Director, BScMRS, Dept. of Radiation Oncology, Temerty Faculty of Medicine, University of Toronto
12. MRS Program Coordinator, Temerty Medicine, University of Toronto
13. Acting Associate Registrar, Admissions & Systems, The Michener Institute of Education, University Health Network
14. Registrar, The Michener Institute of Education, University Health Network
15. Students | Radiation Therapy
16. Students | Nuclear Medicine Technology
17. Students | Radiation Technology Students
18. Faculty | Temerty Faculty of Medicine, University of Toronto and The Michener Institute of Education, University Health Network
19. Administrative Staff | Temerty Faculty of Medicine, University of Toronto and The Michener Institute of Education, University Health Network
20. Alumni
21. Employers

Current Review: Findings and Recommendations

1. Undergraduate Program

Unless otherwise noted, all bulleted comments apply to all programs reviewed.

The reviewers observed the following **strengths**:

- Overall quality
 - ▶ MRS Program and its graduates have a good reputation within Canada; program is highly respected by employers and alumni
- Objectives
 - ▶ Curriculum emphasizing critical thinking, evidence-based practice and problem solving is well-aligned with the mission of both the University and the Michener Institute
 - ▶ Learning outcomes appear appropriate and are aligned with undergraduate degree-level expectations
- Admissions requirements
 - ▶ Appropriate admissions requirements ensure that students with the academic ability and wider skills are accepted into the program
- Curriculum and program delivery
 - ▶ SPECT/CT component of Nuclear Medicine curriculum appears to be reflective of current practice; students gain PET/CT experience through clinical rotations
 - ▶ Interprofessional Education curriculum noted as impressive and highly valued by students
 - ▶ Students, faculty, alumni, employers and program leadership noted the importance and value of having UofT appointed Radiation Therapists, Medical Physicists, and Radiation Oncologists provide lectures and share their expertise with Radiation Therapy students
 - ▶ Engagement with clinical placement sites ensures that students receive experiential learning opportunities
 - ▶ Multiple laboratory and imaging facilities enhance the teaching and learning environment
 - ▶ Commendable recent curriculum renewal projects, with plans underway for other necessary revisions
- Innovation
 - ▶ Simulation learning opportunities provided to students in all streams
 - ▶ Laboratory facilities noted as outstanding; students appreciate current and well-equipped simulation learning spaces
 - ▶ Planning underway to develop learning activities in CT Simulation, Magnetic Resonance Imaging and Proton Therapy for Radiation Therapy
- Accessibility and diversity
 - ▶ Appropriate systems and processes are in place to support students with disabilities, including an accessibility services advisor
 - ▶ Range of teaching and learning methods provide an inclusive environment for students

- Assessment of learning
 - ▶ Teaching and learning methods are appropriate to deliver program learning outcomes
 - ▶ Clear assessment strategy outlined in the program documentation, with clear thresholds for passing assessments and pathways for students experiencing difficulty
 - ▶ Range of assessment tools enables alignment of appropriate assessments with topics being assessed, and allows students who struggle with one type of assessment to excel in other types
 - ▶ Competency assessments are appropriate for clinical practice, ensuring students meet practical requirements for entering the profession
 - ▶ A wide range of clinical evaluations are undertaken, with a rigorous process to ensure parity between clinical placement sites
- Student engagement, experience and program support services
 - ▶ Recent changes (e.g., delivery of the Anatomy module at U of T) help with student awareness of the University facilities and supports available
 - ▶ All student groups spoke very highly of the delivery and ease of navigating the e-learning platform
 - ▶ Students expressed satisfaction with updated Nuclear Medicine curriculum
 - ▶ Nuclear Medicine students commented that they feel satisfied with the updated curriculum and that they feel well-supported, with good relationships with instructors
 - ▶ Students and alumni expressed a high level of satisfaction regarding various components of the educational experience, including the variety of academic supports available and opportunities to provide feedback in didactic and clinical settings
 - ▶ Students, alumni, and employers reported that the program is responsive to feedback
 - ▶ Strong recruitment for the Nuclear Medicine stream, with expanding placements due to workforce shortages
- Quality indicators – undergraduate students
 - ▶ Application numbers have remained relatively stable since the last review; with variation in number of applications to the different program pathways
 - ▶ Predicted increase in Nuclear Medicine placements likely to be filled due to “the healthy number of applicants versus places available on the pathway”
 - ▶ Program acceptance rates have varied since last review but are generally excellent
 - ▶ Overall program acceptance rate is similar to programs at the University of Alberta and McMaster/Mohawk
 - ▶ Retention rates are in line with expectations, and are better than many Universities in the UK and Canada
- Quality indicators – alumni
 - ▶ Alumni embody the mission of the University and the Michener Institute
 - ▶ Employers and alumni indicated that MRS graduates are prepared to meet current clinical demands and are on par with graduates from similar programs
 - ▶ Success rate for the CAMRT Certification Examination is comparable to national averages

The reviewers identified the following **areas of concern**:

- Curriculum and program delivery
 - ▶ Nuclear Medicine students would value increased hot lab experience for PET/CT
 - ▶ Feedback from some student groups indicated that “they had difficulty seeing their profession’s role and relevance” in Interprofessional Education activities
 - ▶ Reviewers note challenges posed by rapid curriculum changes
 - ▶ Program stakeholders commented on the lack of opportunity for peer-review of education materials and teaching and learning activities
- Student engagement, experience and program support services
 - ▶ Despite changes, students continue to feel more aligned to Michener than to U of T, using Michener facilities more widely
 - ▶ Limited student awareness of University supports and resources, including a peer tutoring group, mentorship program, and wellbeing supports
 - ▶ Students expressed interest in more formal consultation (e.g., surveys/polls) regarding program changes
- Quality indicators – undergraduate students
 - ▶ Registrations currently below the total number of available placements in the program
- Quality indicators – alumni
 - ▶ Program is missing some important metrics regarding graduates’ employability and career progression; reviewers acknowledge difficulty in gathering such information

The reviewers made the following **recommendations**:

- Curriculum and program delivery
 - ▶ Undertake a comprehensive evaluation of the MRS 2.0 Curriculum Renewal and the Nuclear Medicine Curriculum Renewal projects over the next few years, including feedback from all stakeholders
 - ▶ Consider feasibility of virtual placements in the area of PET/CT practice
 - ▶ Facilitate additional PET hot lab practice, including a mock hot lab for PET and PET syringe shields / injection containers
 - ▶ Explore patient pathways in which Nuclear Medicine is included in their diagnosis / treatment in Interprofessional Education sessions
 - ▶ Students would value more classes and learning relating to EDI and would like to learn more about public health in their curriculum
 - ▶ Engage Medical Imaging Physicists and Radiologists to share expertise and reinforce links between clinical practices and theory
 - ▶ Reviewers endorse proposed curricular enhancements including PET/CT, theranostics, infection prevention and control, EDI and Indigenous populations, artificial intelligence, proton therapy and MR guided radiation therapy as appropriate aspirations for development
 - ▶ Consider including curricular aspects related to public health and planetary health
 - ▶ Explore implementing peer review activities across the teaching and learning continuum
 - ▶ Include patient and public engagement regarding development and delivery of MRS curriculum

- Innovation
 - ▶ Engage with industry to trial new equipment and software
 - ▶ Ensure that stakeholder groups and practitioners are involved in program quality monitoring and curriculum development to maintain currency of the teaching and learning topics in rapidly changing clinical environment
 - ▶ Continue to renew curriculum and laboratory facilities to keep pace with clinical practice evolution for all streams
 - ▶ Expand PET/CT curriculum to include other radiotracers and non-oncology imaging
- Accessibility and diversity
 - ▶ Extend successful EDI initiatives from the Undergraduate Medical Education program into the MRS program, to increase diversity of students and applicants
 - ▶ Explore expanding equity, diversity and inclusivity in the education for Nuclear Medicine students.
 - ▶ Students indicated that they value EDI components in the program but need more education in this area, suggesting that EDI curriculum be embedded throughout the MRS program
 - ▶ Consult with other divisional or institutional units on an approach to including EDI components in the program
 - ▶ Continue to work towards an EDI strategy that also includes Indigenous health concepts.
- Student engagement, experience and program support services
 - ▶ Increase efforts to ensure students engage with and feel connected to the U of T, though more targeted and inclusive communications as well as highlighting the facilities, resources, and supports available through U of T
 - ▶ Promote peer assisted learning and mentorship among students
- Quality indicators – undergraduate students
 - ▶ Explore methods to increase the number of applicants to the MRS program, particularly on the Radiological Technology and Radiation Therapy pathways
- Quality indicators – alumni
 - ▶ Consider using social media platforms to facilitate an alumni group, and to collate data on program graduates' career trajectories

2. Graduate Program(s) n/a

3. Faculty/Research

The reviewers observed the following **strengths**:

- Research
 - ▶ Program leadership team has attempted to identify champions to promote a research culture in medical imaging
- Faculty
 - ▶ Dedicated, committed faculty members bring a wide range of research interests and experience as well as clinical expertise
 - ▶ Extraordinary efforts made by faculty to support student learning and research efforts during the pandemic

The reviewers identified the following **areas of concern**:

- Research
 - ▶ Limited student uptake of research-oriented courses in Radiological Technology and Nuclear Medicine
 - ▶ Various stakeholders noted barriers to research engagement, including formalized access to the clinical environments, lack of research expertise in some of the clinical environments, and lack of time and financial resources
 - ▶ Reviewers noted “the MRS program team did not provide a research strategy and do not appear to have a significant research profile”
 - ▶ Reviewers noted that faculty are not currently supported to undertake PhDs
- Faculty
 - ▶ Reviewers noted faculty comments that observing practice on their clinical days was not felt to be utilizing their skills as much as they would like; some faculty members would like more opportunities to engage with research in the clinical environment

The reviewers made the following **recommendations**:

- Research
 - ▶ Develop a 5-10 year plan, with key deliverables, to bring the research engagement of Radiological Technology and Nuclear Medicine streams proportionally in line with Radiation Therapy stream; “...it remains essential to increase research engagement and expertise in graduates into these areas of practice because there is such a sparse evidence base in so much of Medical Imaging”
 - ▶ Consider developing a process to support MRS instructors wishing to undertake PhD degrees, as well as supporting graduate pathways into PhD programs
 - ▶ Develop faculty research skills as necessary, both to support research on campus and serve as secondary supervisors for research in clinical settings
 - ▶ Engage with radiologists, physicists, and other complimentary professions at the University to kickstart research programs
 - ▶ Engage Medical Imaging Department faculty and wider disciplines to facilitate interdisciplinary research
 - ▶ Integration of teaching faculty with clinical staff would support engagement in clinical and educational research activities, utilize well-equipped simulation laboratory facilities and clinical environments, ensure credibility with students, and foster the culture of scholarly practice
- Faculty
 - ▶ Consider developing a research strategy for MRS faculty to build their research and scholarship; including clinical and/or educational research
 - ▶ Research funding applications and publications should be integral to faculty members’ academic roles for all program streams
 - ▶ Consider honorary contracts with placement providers for program faculty, to access clinical areas to support student research

4. Administration

Note: Issues that are addressed through specific University processes and therefore considered out of scope for UTQAP reviews (e.g., individual Human Resources issues, specific health and safety concerns) are routed to proper University offices to be addressed, and are therefore not included in the Review Summary component of the Final Assessment Report and Implementation Plan.

The reviewers observed the following **strengths**:

- Relationships
 - ▶ High morale among students, who feel that communication pathways with the faculty are good and that informal feedback is well received
 - ▶ Morale among the faculty appeared to be good
 - ▶ Strong relationships with clinical providers
- Organizational and financial structure
 - ▶ MRS program is well-run and well organized, with a passionate, committed leadership team and dynamic, enthusiastic administrative support staff
 - ▶ Program administration is well-coordinated despite team members being located in different areas; processes and procedures work well and appear to be adaptable to changes
 - ▶ In-kind contributions from Department of Radiation Oncology faculty members have aided in MRS program progression
- Long-range planning and overall assessment
 - ▶ Program self-study includes clear strategic plans regarding enrollment strategy, EDI, student financial aid and opportunities, which appear appropriate and deliverable

The reviewers identified the following **areas of concern**:

- Relationships
 - ▶ Some students expressed feeling under-represented on program committees and that they lacked a formal avenue for their voices to be heard
 - ▶ Partnerships with clinical providers are based in part on personal relationships; “we commend the team on their strong relationships, but also recognize that this is an area of potential risk”
 - ▶ Reviewers note limited engagement in the MRS program from Medical Imaging professionals at the University
- Organizational and financial structure
 - ▶ Future deficits in the programs 5-year financial plan noted as a major challenge
 - ▶ Reviewers express concerns that in-kind support provided by UofT appointed faculty members may be at risk without formalized agreements in place, noting that this poses significant risks to financial stability of the program
- Long-range planning and overall assessment
 - ▶ Reviewers note comments from stakeholders that the MRS program does not “promote its successes or the positive impact it has on the broader healthcare community and patient care”

- International comparators
 - ▶ Reviewers note that direct comparisons with other similar programs is challenging due to the unique structure and offerings of the MRS; adding that there is no known inventory of international undergraduate medical radiation sciences programs

The reviewers made the following **recommendations**:

- Relationships
 - ▶ Consider developing formalized contracts with clinical placement providers
 - ▶ Increase engagement from Medical Imaging professionals at the University to enhance education and research, particularly for the Radiological Technology and Nuclear Medicine streams
- Organizational and financial structure
 - ▶ Engage with the MRS Strategic Executive Committee and other relevant provincial stakeholders to ensure financial stability for the program
 - ▶ Implement formalized agreements with the Department of Radiation Oncology for in-kind support
 - ▶ Implement formalized agreements with clinical sites for the clinical coordinator role
 - ▶ Explore broadening the membership of the MRS Strategic Executive Committee to include representation from the Medical Imaging Department.
 - ▶ Develop a sustainable financial plan that does not compromise staffing levels and staff wellbeing
 - ▶ Consider optimizing facilities with new technology (virtual reality x-ray rooms, simulators, etc.) to streamline investment without negatively impacting learning
 - ▶ Reviewers recommend that appointment of new Chair of the Department of Radiation Oncology include consideration of support and collaboration with the MRS program
- Long-range planning and overall assessment
 - ▶ Explore employer-led or virtual open days, to raise awareness of the MRS professions
 - ▶ Work with the professional body and health organizations in Canada to raise the profile of MRS professions
 - ▶ Consult with divisional/institutional recruitment teams regarding strategies to ensure strong messaging about the program, and ensure a high-quality pool of applicants
 - ▶ Consider local and national outreach strategies to engage prospective applicants
 - ▶ Perform a review of continuous quality improvement processes; identify metrics to promote the value and positive impact of the MRS program on healthcare in Canada
 - ▶ Ensure public and patient involvement in the curriculum setting and review processes, along with wider stakeholder engagement to ensure the curricula are up to date and reflect state of the art practices
 - ▶ Ensure ongoing resources for curriculum and facility renewal to mimic clinical practice evolution

2. Administrative Response & Implementation Plan



TEMERTY FACULTY OF MEDICINE
UNIVERSITY OF TORONTO

Temerty
Medicine

L. Trevor Young, MD PhD FRCPC
Dean

Vice Provost, Relations with Health Care Institutions

January 12, 2023

Professor Susan McCahan, Vice-Provost, Academic Programs
Division of the Vice-President & Provost
University of Toronto

Dear Susan,

[BSc, MEDICAL RADIATION SCIENCES](#)
[Dean's Response | Temerty Faculty of Medicine](#)

On behalf of the Temerty Faculty of Medicine at the University of Toronto, I would first like to thank the reviewers, Prof. Susan Fawcett and Prof. Karen Knapp, for their very comprehensive review of the BSc in Medical Radiation Sciences (MRS) program housed in the Department of Radiation Oncology (DRO) on October 14, 2021. I would also like to thank Dr. Fei-Fei Liu, then Chair of DRO, our partners at the Michener Institute, Prof. Cate Palmer, the MRS Director, faculty, and administrative staff, as well as all those who contributed to the preparation of the outstanding self-study report. I also wish to thank the many staff, trainees, faculty, and alumni who met with the external reviewers and provided thoughtful input. The reviewers noted *"The provision [of the program] is of a high standard and the students and alumni appear to be very enthusiastic about their education...[the recommendations] are designed to help develop and take an already excellent provision to the next level."*

The thorough report provided by the reviewers is an invaluable guide for program enhancements and future strategic directions of MRS. The reviewers identified a number of areas for enhancement including curricular offerings, student recruitment, engagement, and support, enrichment of opportunities for student research, and a focus on developing a financial plan for the long-term sustainability of MRS. Of particular note are recommendations to enhance the incorporation of equity, diversity, and inclusion initiatives throughout MRS, as well as a focus on Indigenous Health within the curriculum. Each of the recommendations has been addressed in the Program Response column in the accompanying table, and in Dr. Liu's Response of the Chair. I am in full agreement with the responses of Dr. Liu and the Program, which have been prepared in consultation with the Michener Institute, and have provided additional comments addressing each of the recommendations in the Dean's Response column.

Overall, MRS made excellent progress under the leadership of Prof. Liu, Prof. Palmer, and the MRS Strategic Executive Committee. As noted by the reviewers, *"The MRS program is a well-run, well organized program with a high functioning leadership team. The DRO academic chair, MRS program director, MRS associate program director, and MI academic chairs are passionate, committed leaders."* I congratulate the entire team on their outstanding leadership and look forward to continuing to work them—welcoming the new DRO Chair, Dr. Laura Dawson—to ensure the financial sustainability, success, and growth of MRS to attain its strategic and operational aspirations.

The next review of MRS is scheduled in 2028-29. In 2025 we will follow up with Dr. Dawson on the implementation of the external reviewers' recommendations and, later that year, provide you with an interim monitoring report on the status of the implementation plan.

Sincerely,

Trevor Young, MD, PhD, FRCPC
Dean, Temerty Faculty of Medicine
Vice Provost, Relations with Health Care Institutions

2021-22 UTQAP Review of MED BSc Medical Radiation Sciences program - Review Recommendations

Please do the following for each recommendation in the table:

- If you **intend** to act on a recommendation, please provide an **Implementation Plan** identifying actions to be taken, the time frame (short, medium, long term) for each, and who will take the lead in each area. If appropriate, please identify any necessary changes in organization, policy or governance; and any resources, financial and otherwise, that will be provided, and who will provide them.
- If you **do not** intend to act on a recommendation, please briefly explain why the actions recommended have not been prioritized.
- In accordance with the UTQAP and Ontario's Quality Assurance Framework, "it is important to note that, while the external reviewers' report may include **commentary** on issues such as faculty complement and/or space requirements when related to the quality of the program under review, **recommendations** on these or any other elements that are within the purview of the university's internal budgetary decision-making processes must be tied directly to issues of program quality or sustainability" (emphasis added)
- You may wish to refer to the [sample table](#) provided by the Office of the Vice-Provost, Academic Programs

Request Prompt <i>verbatim from the request</i>	Rec. #	Recommendations from Review Report <i>verbatim from the review report</i>	Program Response	Dean's Response
The reviewers recommend that the program undertake a comprehensive evaluation of the MRS 2.0 Curriculum Renewal and the Nuclear Medicine Curriculum Renewal projects over the next few years, including feedback from all stakeholders.	1	"Undertake a comprehensive evaluation of the MRS 2.0 Curriculum Renewal and the Nuclear Medicine Curriculum Renewal projects over the next few years including feedback from all stakeholders."	The changes made to the curriculum due to the MRS 2.0 Curriculum Renewal project were completed by Summer 2020. In addition, further changes were made to the delivery format due to the pandemic, a new national competency profile has come into effect and new courses have been added to the radiation therapy and nuclear medicine streams. The MRS Program plans to evaluate all the above in a MEDIUM TERM (1-2 years) The Nuclear Medicine Curriculum Renewal project evaluation was completed in 2018.	Changes to both the MRS 2.0 Curriculum Renewal and the Nuclear Medicine Curriculum Renewal projects have already been implemented, with evaluation of the Nuclear Medicine Curriculum Renewal project completed in 2018, and evaluation of the MRS 2.0 Curriculum Renewal project to take place in the next 1-2 years. Feedback from all stakeholders will be integral to the upcoming evaluation.
	2	"Continue to renew curriculum to keep pace with clinical practice evolution for all streams."	See #1 above LONG TERM (3-5 years)	Curriculum renewal will continue as noted in #1 above.
	3	"Ensure that there is public and patient involvement in the curriculum setting and review processes along with wider stakeholder engagement to ensure the curricula are up to date and reflect state of the art practice."	Engaging public/patients and various stakeholders in curriculum review is now an accreditation standard, articulated by Equal – Accreditation Canada. ONGOING	A new accreditation standard requires regular engagement of public/patient and other stakeholder involvement in curriculum review and will be undertaken accordingly.

<p>The reviewers observed that EDI components in the program are highly valued by students and recommended continuing to work towards an EDI strategy that also includes Indigenous health concepts; they also commented that innovative and successful EDI initiatives implemented in the MD program should be extended to the MRS program.</p>	4	<p>“Continue to work towards an EDI strategy that also includes Indigenous health concepts.”</p>	<p>The MRS Program has a longitudinal Interprofessional Professional Education course in Year 2, which is linked to the Centre for Collaborative Healthcare and Education (CACHE). CACHE is developing three new modular topics: EDI, Indigenous Health and Resilience/Wellness, which will be built into the EMRS (IPE) course for all MRS students including Nuclear Medicine.</p> <p>Additionally, the MRS Program currently has embedded within the Clinical Behavioural Sciences course the requirement to complete a minimum of two modules (Indigenous Knowledge & Traditional Health, and Health Literacy – Indigenous Perspectives on Health and Well-being) from the Indigenous Relationships & Cultural Awareness Course offered through Cancer Care Ontario.</p> <p>MEDIUM TERM (1-2 years)</p>	<p>The “Program Response” has highlighted important additions to the MRS Program curriculum that centre concepts of EDI and Indigenous Health. In addition to the development of 3 new modular topics (including EDI and Indigenous Health), a minimum of two separate Indigenous Health modules offered by Cancer Care Ontario are required for completion of the Clinical Behavioural Sciences course. Further to these program specific initiatives, Temerty Medicine has recently expanded the MD Program’s Office of Indigenous Medical Education to create the new Office of Indigenous Health, which provides advisory support, resources, and student support for all departments and programs within Temerty Medicine, in partnership with the Centre for Wise Practices at Women’s College Hospital.</p>
	5	<p>“Explore expanding equity, diversity and inclusivity in the education for Nuclear Medicine students.”</p>	<p>See #4 above.</p> <p>MEDIUM TERM (1-2 years)</p>	<p>A modular topic on EDI is being developed by the Centre for Collaborative Healthcare and Education for Year 2 of the MRS Program. Further to this, the Temerty Medicine Office of Inclusion & Diversity, as well as the Associate Dean, Inclusion & Diversity, provide consultation, resources, and support for all programs and departments looking to expand EDI in curriculum.</p>
	6	<p>“It is recommended that the innovative initiatives that are being implemented in areas such as the undergraduate medical education (UME) program are extended to the MRS program, which may also assist with developing closer ties with the university.”</p>	<p>MRS will investigate appropriate offerings through UME.</p> <p>IMMEDIATE (6 months)</p>	<p>MRS will take immediate action (in the next 6 months) to investigate which UME initiatives may be appropriate to extend to the MRS Program.</p>
<p>The reviewers noted the widely acknowledged value of having University appointed radiation therapists, medical physicists, and radiation oncologists provide lectures and share their expertise with Radiation Therapy students and recommended implementing a</p>	7	<p>“Stakeholders from the Medical Imaging streams indicated that leveraging this same model for their streams would improve various components in the curriculum. For example, it was mentioned that by having Medical Imaging Physicists and Radiologists provide lectures for the Radiological</p>	<p>Working with our diagnostic medical imaging clinical partners the MRS Program will investigate the opportunities to have radiological technologists/nuclear medicine technologists, radiologists, etc. teach in the program.</p> <p>MEDIUM TERM (1-2 years)</p>	<p>There is an opportunity to explore possibilities for radiological and/or nuclear medicine technologists, radiologists, and others to teach in the program in order to help students potentially improve their practice in the longer term.</p>

similar model for Radiological Technology and Nuclear Medicine students involving medical imaging physicists and radiologists.		Technology and Nuclear Medicine students would improve students' understanding of image interpretation and diagnostic quality, thus potentially improving their practice in the longer term."		
	8	"Engage Medical Imaging Physicists and Radiologists to share expertise."	See #7 above. MEDIUM TERM (1-2 years)	See #7 above
Recognizing that the program's unique structure may require creative approaches, the reviewers recommended the development of medium- and long-term plans to increase opportunities for student academic experience in the program to be enriched by research, particularly in the Radiological Technology and Nuclear Medicine streams.	9	"Develop a medium-term plan over the next 5 years and a long-term plan over 10 years with key deliverables to bring the engagement of Radiological Technology and Nuclear Medicine proportionally in line with Radiation Therapy for research engagement. This may include: considering the use of facilities within Michener to develop research opportunities and the consideration of experimental work, which could be done using these; engagement with industry to trial new equipment / software; etc."	The MRS Program notes that this will require a significant cultural shift in faculty's engagement with research. While we recognize the importance of Michener faculty conducting research it will be an extremely low priority for the program as we focus on delivery of curriculum post-pandemic. LONG TERM (3-5 years) As per #7 above, working with our diagnostic medical imaging clinical partners the MRS Program will investigate opportunities to have clinicians provide research enriched teaching sessions in the radiological technology and nuclear medicine streams. MEDIUM TERM (1-2 years)	Due to the large cultural shift required to facilitate substantial research engagement, this will be prioritized over the longer term of 3-5 years. Opportunities to incorporate research enriched teaching sessions in the radiological technology and nuclear medicine streams will be prioritized in the medium term of 1-2 years.
	10	"Upskilling the Faculty as necessary so they can both support research on campus, but also be a secondary supervisor for research in clinical settings and supporting faculty to develop through PhDs studies for those with an appetite to do so."	See #9 above Michener faculty are encouraged, through their organization, to pursue higher academic credentials. Professional development (PD) funds are allocated for advanced academic credentials. These funds are in addition to annual Michener PD funds. Research participation could be apportioned to the 12 PD days allocated annually, for those faculty who are interested.	Opportunities for Michener faculty members to pursue higher academic credentials and professional development are encouraged by the Program.
	11	"Consider honorary contracts with placement providers for members of the Faculty so they can access clinical areas to support student research."	See #9 above Michener faculty do not have cross-appointments with clinical institutions, nor do they have dedicated	Due to Michener faculty members not having cross-appointments with clinical institutions, they are not in a position to access clinical areas to support student research. In addition, these faculty members do not have

			time/resources/grant funding opportunities to conduct educational research.	dedicated time/resources/funding to lead educational research. Opportunities for research collaborations may allow Michener faculty to leverage their expertise and experience to support student research.
12	“Engage with radiologists / physicists and other complimentary professions at the UofT to kickstart research programs.”	See #9 above		See #9 above
13	“The MRS program should investigate having the teaching faculty engage in clinical and educational research activities that may utilize the well-equipped simulation laboratory facilities and the clinical environments.”	See #11 above		See #11 above
14	“Engage TFoM Medical Imaging Department faculty and wider disciplines to facilitate interdisciplinary research.”	See #9 above		See #9 above In addition, Temerty Medicine’s current Academic Strategic Plan (2018-2023) highlights “Ecosystem of Collaboration” as one of the 3 core pillars of the Plan. This includes the goal of enabling integration and collaboration opportunities across Temerty’s sectors and educational portfolios. Core objectives include: a) creating tools, resources and venues to enable easy sharing of existing research, innovation and scholarship across the Faculty and among our academic partners, and 2) investigating, designing and implementing incentives for meaningful collaboration across the entire academic health sciences network.
15	“Explore developing a full research strategy for the MRS faculty to build their research and scholarship. This may include clinical research, educational research or both. Research funding applications and publications should be integral to their academic roles for all streams within MRS.”	See #9 above		See #9 above

<p>The reviewers observed that program registrations are currently falling below the total number of students that can be accommodated in the program, and recommended exploring ways to increase enrolments in the Radiological Technology and Radiation Therapy streams as well as leveraging external partnerships to raise the overall profile of the Medical Radiation Science professions.</p>	16	<p>“Explore methods to increase the number of applicants to the MRS program, particularly on the Radiological Technology and Radiation Therapy pathways.”</p>	<p>As little-known professions, recruitment is an ongoing challenge for the MRS Program.</p> <p>The MRS Program is continually reviewing and modifying its approach to both in-person and online recruitment events.</p> <p>ONGOING</p>	<p>The program is engaging in ongoing attempts to review and modify the program’s approach to recruitment for both in person and online events.</p> <p>Through the Office of Access and Outreach new opportunities exist to enhance awareness of the MRS program and associated career opportunities, particularly among students from underserved communities.</p>
	17	<p>“Explore employer led open days or virtual open days online for students to access to raise awareness of the MRS professions.”</p>	<p>As Health Human Resource (HHR) needs at our clinical partner sites continue to increase, employer led/involved sessions are increasing. Online sessions, “Ask a Medical Radiation Technologist” has proven popular.</p> <p>ONGOING</p>	<p>On an ongoing basis, the Program identifies opportunities for students to become aware of the MRS professions. Please also see #16.</p>
	18	<p>“Work with the professional body and health organizations in Canada to raise the profile of MRS professions.”</p>	<p>The National Association (Canadian Association of Medical Radiation Technologists) Strategic Plan 2022-2026, includes more advocacy of the profession, including increasing the profile of the profession through targeted awareness. The MRS Program will work with the CAMRT and build on existing strategies to increase and maintain enrolment.</p> <p>LONG TERM (3-5 years)</p>	<p>The MRS Program has a long-term strategy to collaborate with the Canadian Association of Medical Radiation Technologists to help raise the profile of MRS professions.</p>
	19	<p>“Explore using models developed by Medicine to increase the diversity of applicants to support the MRS program.”</p>	<p>The MRS Program will connect with the MD Enrollment Services, to determine if the models used by MD to increase diversity are appropriate.</p> <p>MEDIUM TERM (1-2 years)</p>	<p>The MRS Program will explore opportunities with MD Enrollment Services to learn about models to increase diversity of applicants in the MRS Program. In addition to this, Temerty Medicine has created a newly established Office of Access & Outreach whose mandate it is to work with all programs and departments across the Faculty to create targeted programs to increase the representation of historically underserved and underrepresented groups in health professions education.</p>
	20	<p>“Consider strategies of recruitment at the UofT and invite the wider recruitment team to visit the program team to ensure strong messaging about the program is provided.”</p>	<p>U of T recruitment teams’ priority is recruitment to the UG first-entry programs and professional second-entry programs, generally are responsible for their own recruitment efforts.</p>	<p>The MRS program has a strategy to connect with the U of T recruitment team, which also includes a group of individuals focused on increasing and supporting diversity within the student body.</p>

			The MRS Program will connect with the wider U of T recruitment team, to explore messaging strategies for the MRS Program. MEDIUM TERM (1-2 years)	
	21	“Explore new approaches to student recruitment to ensure a high-quality pool of applicants.”	See #16 above. ONGOING	See #16, 17, 19, and 20 above.
	22	“Consider how local and national outreach could also engage potential future students for the MRS program.”	The MRS Program will continue with recruitment efforts both provincially and nationally. Northern Ontario will be a focus provincially. MEDIUM TERM (1-2 years)	Focusing on Northern Ontario for outreach is a priority in the medium term. Through Community of Support, a Temerty Medicine mentorship program for students from underserved communities, new opportunities exist to engage potential future students locally, provincially, and nationally. The Community of Support program currently mentors 3800 students across Canada.
The reviewers observed that MRS students felt more aligned with the Michener Institute, using facilities and supports there more widely; they recommended more targeted communications to increase awareness of University-provided student supports such as peer tutoring and mentorship programs.	23	“More targeted communications from UofT. Students outlined that communications from UofT were much fewer than from Michener and were often without a wider context. Careful consideration regarding the inclusivity of these communications would improve them.”	The MRS Program will be deliberate with communications to the students, highlighting the context for the communication. ONGOING	In addition to the program’s efforts to enhance communications to the students, Temerty Medicine is consistently monitoring and evaluating how to best reach student groups through Faculty and University communications channels.
	24	“Highlighting the facilities which students have access to at UofT because they feel they have a lack of awareness regarding what resources and supports are available to them.”	UofT services vs. Michener services are extensively highlighted through Orientation activities. Communication to upper year students about the services will continue to be emphasized. ONGOING	In addition to the program’s efforts to emphasize communications about resources and supports for the students, Temerty Medicine works regularly to update the website and other communications channels in order to ensure that information about resources and supports for students is clear and accessible.
	25	“Ensure the mentorship and peer assisted learning schemes are widely advertised to students and that students are aware of the benefits of delivering as well as receiving peer assisted learning and mentoring.”	During the pandemic with support from leadership the MRS Student Society (MRSS) established a mentoring program for the incoming cohort of students. It has been well received by both mentors/mentees (upper year students) and the program will ensure that this initiative is supported, encouraged, and well communicated. ONGOING	The MRS program’s successful mentorship program will continue to be offered to students on an ongoing basis.

<p>The reviewers commented that Nuclear Medicine students felt that they were under-represented on program committees, and that they lacked a formal avenue for their voices to be heard outside of the program team.</p>	26	<p>“While some groups of students felt adequately represented on committees, the Nuclear Medicine students felt that they were under-represented and that they lacked a formal avenue for their voices to be heard outside of the program team.”</p>	<p>The Nuclear Medicine students are the smallest cohort stream in the MRS Program. That said the last two Presidents of the MRS Student Society (MRSS) have been from Nuclear Medicine. The MRS Program will work with MRSS to continue to encourage Nuclear Medicine students’ engagement.</p> <p>IMMEDIATE TERM (6 months)</p>	<p>The MRS is liaising with the MRSS in order to foster the active engagement of Nuclear Medicine students.</p>
<p>Noting the absence of metrics regarding employability and career trajectory of program alumni, the reviewers recommended the creation of an alumni group, using social media platforms, to collect this information and to help connect students with potential employers.</p>	27	<p>“Recommendation: To trial methods using social media platforms to collate data on the destinations of graduates in their first roles and to support collation of data in the future.”</p>	<p>Development of an alumni group is not a priority currently as the MRS Program (UTDRO office) does not have the staffing or financial resources to support this initiative. However, recognizing that many of the applicants indicate they know of or have personal contact with someone in the program, the MRS Program will strive to address this recommendation, as part of the ongoing recruitment strategy.</p> <p>LONG TERM (3-5 years)</p>	<p>Due to limited staffing and financial resources in the MRS Program UTDRO office, it is not currently a priority to collect and/or collate data on the destinations of graduates in their first roles post graduation. The MRS Program does, however, have a plan to address this recommendation in the long term as part of the ongoing recruitment strategy.</p>
<p>The reviewers raised concerns regarding the long-term sustainability of the program, noting that the five-year plan includes future deficits, and that essential in-kind contributions from the Department of Radiation Oncology have been based on informal agreements; they made recommendations including the development of a financial plan to ensure program sustainability without compromising staffing levels and staff wellbeing.</p>	28	<p>“The reviewers are concerned that without formalized agreements in place, the vital in-kind support provided by UofT appointed faculty members is at risk. The MRS program progression and possibly its very existence is at risk given the current financial situation. The reviewers would encourage the MRS program to engage with the MRS Strategic Executive Committee and other relevant provincial stakeholders to ensure financial stability.”</p>	<p>A new Chair was appointed effective January 1, 2023.</p> <p>The recommendations from the departmental review, indicated that UTDRO should conduct a comprehensive analysis to build a model for long-term financial sustainability in addition to the financial/resources implications for the MRS Program. This will be the responsibility of the new Chair in collaboration with the Dean and the central University.</p> <p>LONG TERM (3-5 years)</p>	<p>Temerty Medicine’s Dean is committed to working collaboratively with the new Chair of the Department of Radiation Oncology and the central University to address long-term financial stability and sustainability of the MRS Program.</p>
	29	<p>“Implement formalized agreements with UofT T FoM DRO for in-kind support.”</p>	<p>See #28 above</p>	<p>See #28 above</p>
	30	<p>“Implement formalized agreements with clinical sites for the clinical coordinator role.”</p>	<p>As Clinical Coordinators are employees of the clinical sites, this may be a challenge to implement broadly.</p> <p>This will be investigated in collaboration with the Michener.</p> <p>IMMEDIATE TERM (6 months)</p>	<p>The MRS Program will be exploring with the Michener opportunities to implement formalized agreements with clinical sites for the clinical coordinator role.</p>

	31	“Ensure ongoing resources for curriculum and facility renewal to mimic clinical practice evolution.”	See #28 above	See #28 above. Curricular renewal to keep pace with clinical advancements is an ongoing feature of program enhancement.
	32	“We recommend the MRS program works with Michener, UofT and other stakeholders to develop a financial plan moving forward which is sustainable and does not compromise staffing levels and staff wellbeing. This may mean recruiting to the planned target numbers of students to maximize income. Consideration of optimizing facilities in light of new technology such as virtual reality x-ray rooms, simulators etc. may provide opportunities to streamline investment without negatively impacting learning.”	See #28 above	The Dean is committed to working in collaboration with the MRS Program, Michener and other stakeholders to create a financial plan for stability and sustainability for the MRS Program.
Other recommendations not prioritized in the Request for Administrative Response	33	“Expand the PET/CT curriculum to include other radiotracers and non-oncology imaging, with particular consideration of dementia/ Parkinson’s imaging, PSMA prostate imaging and Choline imaging for parathyroid adenomas... Extend PET/CT curriculum beyond FDG to consider include neuroimaging, PSMA prostate imaging and Choline imaging to name a few.”	A new PET/Theranostics course has been developed, approved through the appropriate governance at Michener and will be presented for approval at the Education Committee of Faculty Council this Fall. The first offering of the course will be Summer 2023. IMMEDIATE (6 months)	The Education Committee of the Faculty Council has approved the introduction of a new PET/Theranostics course in the PET/CT curriculum.
	34	“Extend the PET/CT curriculum to touch on new dynamic / parametric imaging capabilities of equipment and the potential use and impact of this new technology.”	See #33 above IMMEDIATE (6 months)	See #33 above
	35	“Facilitate some additional PET hot lab practice. This is safely achieved using cold sources or saline for handling with the heavier syringe shields and using the	This will be investigated in collaboration with the Michener. Michener faculty have specific workload hours as per their Collective Agreement and supervision for additional	The MRS Program is collaborating with the Michener to investigate the facilitation of additional PET hot lab practice, keeping in mind the workload hours for Michener faculty as per their Collective Agreement.

	PET pot. This could be mocked up in a lab setting at the Michener for cold use.”	labs can be suggested as per Continuous Quality Improvement (CQI) IMMEDIATE (6 months)	
36	“Explore including patient pathways where Nuclear Medicine is included in their diagnosis / treatment (in the case of Theranostics) in IPE sessions.”	This will be investigated in collaboration with faculty and the Centre for Collaborative Healthcare and Education (CACHE). MEDIUM TERM (1-2 years)	The MRS Program will work with the Centre for Collaborative Healthcare and Education and faculty members to explore the inclusion of patient pathways in IPE sessions. CACHE has also worked on creating the appropriate guidelines and principles for the inclusion of patient engagement in health professions education.
37	“Implement peer review activities across the teaching and learning continuum.”	Continuous Quality Improvement (CQI) is valued in the MRS Program. CQI sessions are held 3x year, where faculty provide input into course changes based on student evaluations. Further peer review activities will be investigated further in collaboration with faculty, Centre for Teaching Support & Innovation (UofT) and Centre for Learning & Innovation (Michener). LONG TERM (3-5 years)	In addition to the Centre for Teaching Support & Innovation (U of T) and Centre for Learning & Innovation (Michener), the Centre for Faculty Development co-funded by Temerty Medicine and Unity Health provides workshops, sessions, and consultation on the inclusion of peer review activities in health professions education.
38	“Perform a review of continuous quality improvement processes.”	Continuous Quality Improvement (CQI) is valued in the MRS Program. Student feedback/response to evaluations has steadily declined over the last number of years. The MRS Program will review CQI processes to generate the quantity/quality of feedback needed to improve the curriculum. LONG TERM (3-5 years)	The MRS Program has acknowledged the steady decline of student feedback/response to evaluations over the past several years and will take steps to review CQI processes to address this.
39	“Explore broadening the membership of the MRS Strategic Executive Committee to include representation from the UofT TFoM Medical Imaging Department.”	In agreement with the Department of Medical Imaging at the Temerty Faculty of Medicine, medical imaging representatives from the Joint Department of Medical Imaging (JDMI) at UHN are active members on the MRS Strategic Executive Committee. They include Deputy Head, JDMI Education and the Clinical Director, JDMI. ONGOING	While the Strategic Executive Committee presently includes JDMI leaders at UHN, the Program will investigate expanding the membership to Medical Imaging faculty at other fully-affiliated hospitals.

3. Committee on Academic Policy & Programs (AP&P) Findings

The spokesperson for the reading group reported that in the summary section on Research/Faculty which stated “Limited student uptake of research-oriented courses in Radiological Technology and Nuclear Medicine” could emphasize the link made by reviewers between very low student uptake (1-2 students) with the “insufficient role models for the students to identify in these areas of practice”. The reading group reported that the Dean’s administrative response had adequately addressed issues identified by the review, however, asked the Department to further address the concerns around Interprofessional Education (IPE) Activities and the limited student uptake on research courses. The reading group agreed that the administrative response had included a forward-looking plan.

Professor Cate Palmer, Director, Medical Radiation Sciences Program commented on several initiatives and programs offered in the IPE core activities such as team building, conflict resolution and communications. She described ongoing developments to improve on several issues highlighted by the reviewers, such as research challenges, enhanced mentorship and inclusion.

No follow-up report was requested.

4. Institutional Executive Summary

The reviewers praised the program as well-run, with high-functioning and committed leadership, and a team that is well-coordinated and versatile despite locations in different areas. They highlighted the strong application and registration numbers in the Nuclear Medicine stream, and noted that students are well-prepared for professional certification exams and enjoy success rates comparable to national averages. They commended recent major curriculum renewal projects, both completed and ongoing, in response to the rapid evolution of professional practice in all streams. Finally, they praised the outstanding laboratory, imaging, and simulation facilities, strong morale amongst faculty and students, and overall sense that the program is responsive to feedback.

The reviewers recommended that the following issues be addressed: undertaking a comprehensive evaluation of recent curriculum renewal projects, including feedback from all stakeholders; continuing to work towards an EDI strategy that also includes Indigenous health concepts and extending innovative and successful EDI initiatives from the MD program to the MRS program; inviting medical imaging physicists and radiologists to provide lectures and share their expertise with Radiological Technology and Nuclear Medicine students; developing medium- and long-term plans to increase research engagement, particularly in the Radiological Technology and Nuclear Medicine streams; exploring ways to increase enrolments in the Radiological Technology and Radiation Therapy streams and leveraging external partnerships to raise the overall profile of the Medical Radiation Science professions; developing targeted communications to increase awareness of University-provided student supports such as peer tutoring and mentorship programs; ensuring that Nuclear Medicine students are represented on program committees and providing a formal avenue for their voices to be heard outside of

the program team; creating an alumni group using social media platforms to collect information on the employability and career trajectory of graduates, and to help connect students with potential employers; developing a financial plan to ensure program sustainability without compromising staffing levels and staff wellbeing. The Dean's Administrative Response describes the Faculty and program responses to the reviewers' recommendations, including an implementation plan for any changes necessary as a result.

5. Monitoring and Date of Next Review

In 2025 the Dean will follow up with the Chair of the Dept. of Radiation Oncology on the implementation of the external reviewers' recommendations and will provide an interim report to the Vice-Provost, Academic Programs no later than December 2025 on the status of the implementation plans.

The next UTQAP review of the BScMRS will be commissioned in 2028-29.

6. Distribution

On June 30, 2023, the Final Assessment Report and Implementation Plan was posted to the Vice-Provost, Academic Programs website and the link provided by email to the Dean of the Temerty Faculty of Medicine, the Secretaries of AP&P, Academic Board and Governing Council, and the Ontario Universities Council on Quality Assurance. The Dean provided the link to unit/program leadership.