

Potential Implications of Advanced Practice Radiography on the Canadian Healthcare System from Technologists Perspectives

Marienell Talla¹, Bharvita Nakum² and Sarah Abdul-Jalil³

¹ Michener Institute of Education at UHN, Toronto, ON, Canada

² Michener Institute of Education at UHN, Toronto, ON, Canada

³ Michener Institute of Education at UHN, Toronto, ON, Canada

E-mail: 17mt3@michener.ca

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Abstract

Advanced practice in healthcare has emerged as a meaningful way to optimize resources and improve the patient experience. Published studies from other countries have shown that the advancement of the radiographer's role has been successful in a variety of healthcare systems. While the Canadian Association of Medical Radiation Technologists developed a framework for the advanced practice of technologists, formal training and certification for an advanced radiographer role has yet to be introduced within the Canadian healthcare system. Despite this, many technologists currently perform delegated tasks beyond the scope of their described role. Understanding more about these delegated tasks can shed light on potential implications of a formal advanced practice radiographer role in Canada. When interviewed, many technologists find that on-site training for performing these procedures is sufficient and they were able to observe improved patient care in the department. In conclusion, this paper is written to reiterate the evidence supporting the development of an Advanced Practice role for Radiological Technologists, as well as present the perspective of technologists who perform procedures outside of a conventional technologist role.

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1. Introduction

As healthcare systems evolve to meet new challenges, modifications to professional roles can help with the ultimate goal of optimizing resources and improving patient care. A classic example of this is the establishment of the nurse practitioner role that granted nurses the ability to assess, diagnose, and prescribe treatments to patients (1). Not only did the development of this advanced practice (AP) role help decrease workload of physicians and healthcare costs (2, 3), but studies have shown that the integration of the nurse practitioner role can lead increased accessibility in remote areas (4), reduce re-admissions to the

emergency room (5), and increased job satisfaction for nurses (3). Thus, advanced practice roles can provide important benefits to healthcare systems while also further benefiting the practitioners by providing job satisfaction and long-term fulfillment (3). Similarly, other healthcare professions that do not have AP roles can be delegated tasks outside the normal scope to help increase departmental efficiency and improve quality of care. An example within the imaging department are sonographers, who not only take the images necessary for diagnosis but also submit a technical report prior to sending it to the radiologist (6). This practice saves time and speeds up the diagnosis process, ultimately benefiting the patient and the healthcare facility (6). Another profession whose

scope can be expanded to result in similar benefits to the department is the role of radiological technologists. Therefore, the intent of this paper is to review current research on Advanced Practice Radiological Technologists (APRTs) with insight from practicing Canadian technologists who currently execute AP procedures to explore the potential implications implementing an APRT on the Canadian healthcare system.

Some countries have already integrated forms of an APRT role into their health care system; with the American and United Kingdom models being key examples. In the United States, Radiological Technologists have the opportunity to become certified as Radiologist Assistants, which expands their scope to include performing radiological-focused patient assessments and select radiological procedures, as well as contributing to image analysis under radiologist supervision (7). Similarly, the United Kingdom defines multiple certified APRT roles, such as specialized Consultant GI or Breast Radiographers, who can perform specific procedures independently and contribute to image interpretation (8).

Studies have shown multiple benefits of these roles with evidence to support that APRT roles lead to increased job satisfaction for MRTs, reduced physician workload, increased patient benefits due to reduced wait times, increased accuracy of image interpretation, and increased cost effectiveness in the healthcare systems in which they operate (9). Literature also cites common barriers to AP, such as radiologist resistance and radiographers' concern for increasing responsibility and legal implications (investigate the effect of AP on patient outcomes and the patient perspective (10)). As a result, the Canadian Association of Medical Radiation Technologists (CAMRT) has begun to lay the foundation for AP in Canada through the framework.

The CAMRT Advanced Practice framework provides a platform for the development of APRTs in the Canadian healthcare system. It briefly reinforces the benefits of advanced practice for all MRT roles using evidence from other healthcare models but is otherwise vague in providing guidelines on implementing APRT roles in Canada due to provincial jurisdiction limitations (11). Moreover, while there has been successful implementation and development of the AP Radiation Therapy role known as Clinical Specialist Radiation Therapist in Ontario (12), there has been little progress on the establishment of a certified AP radiographer role. In radiography, the two potential tasks that can be delegated to the radiological technologists are reporting and procedural work. Radiographer reporting, where technologists provide a preliminary

report of their findings, is usually only done in healthcare systems where there is a formal APRT roles, since these certified technologists usually complete higher-level education in order to be deemed capable of reporting (11). On the other hand, there is room in a radiographer's role to take up certain procedural tasks that can potentially benefit the Canadian healthcare system by reducing workload on physicians and improving patient flow (11). As a result, some health care centers have independently chosen to extend and increase the responsibilities of radiographers. To explore this phenomenon, on January 28th, 2019, we carried out an interview with the Clinical Instructor and the lead Gastrointestinal and Genitourinary technologist about a procedure at Sick Kids Hospital, the Voiding Cystourethrogram (VCUG), that was initially performed by radiologists and has now transitioned to become a procedure done solely by technologists. In addition, a survey (available in Appendix A) was also sent out via email to radiological technology clinical coordinators at multiple hospitals within the Greater Toronto Area. The clinical coordinators could either complete survey themselves or forward it to technologists in the imaging department to get additional perspectives on the different advanced practice procedures performed at that site. The responses to the survey are primarily from St. Michael's Hospital, Humber River Hospital, Sunnybrook Health Sciences Center, and Mount Sinai Hospital. The insight from the survey responses and interview will serve as a narrative to illustrate the potential implications of procedural-based advanced practice radiography in the Canadian healthcare system.

2. Improving Workload

One of the current major issues of the Canadian healthcare system that AP can assist with is patient wait time or delay in acquiring appointments. The clinical instructor at Sick Kids explained that initially a VCUG procedure would involve a radiologist, a nurse and a technologist. The nurse would catheterize the patient, then the radiologist would perform the imaging component; both with assistance from the technologist. She emphasized on how difficult it was to ensure that the catheter remained in the appropriate position in an aggravated child while waiting on the radiologist. This less than optimal delivery of patient care and the high volume of VCUG exams being requested were the main reasons the imaging procedure became delegated to technologists. According to the technologists who were present during this transition, when technologists started performing

VCUGs without a radiologist present, the amount of time needed to successfully perform the procedure decreased and thereby decreased the likelihood of the catheter accidentally coming out as well. In addition, the technologist stated during the interview that patient compliance and satisfaction was also significantly improved, and technologists were able to complete up to 10 VCUGs per day with minimum delay. This left time for the radiologists to perform more complex procedures and to report exams in a timelier manner. Similarly, this was also observed with Peripherally Inserted Central Catheter (PICC) line insertions, which are done at multiple GTA hospitals such as Sunnybrook, Humber, Mt. Sinai and St. Michael's Hospital by trained radiological technologists. Most of the supervisors noted a positive improvement in the workflow within departments where technologists are now performing this task. They explained that when radiologists do the cases, they can be delayed because of their workload and so the procedures have a higher likelihood of being completed when they are carried out by technologists. However, one clinical instructor at Mount Sinai expressed the negative impact of having a dedicated technologist for beside PICC line insertions, especially on days where the department was short-staffed on technologists for imaging. Overall, having technologists perform these tasks was perceived as being advantageous not only to the medical imaging department, but to the nurses and radiologists as well since it provided them opportunities to focus on other work.

3. Cost Reduction

In addition to saving time, advanced practice radiography can have potential cost-saving implications as well. Advanced practice for radiographers has been introduced as a means to reduce service costs to hospitals. A study in the UK was conducted to evaluate whether there was any cost and time saving when Barium Enema studies were carried out by radiographers rather than radiologists (13). The study concluded that there was no difference in the time it required technologists and radiologists to complete the procedures, and therefore having radiographers conduct the exam would not save much time (13). However, it did state that there were some cost saving benefits. The study evaluated that 100 barium enema procedures would cost around £1787 when performed by radiologists, in comparison to £1406 when performed by radiographers (13). These cost savings can potentially be applied to the Canadian healthcare system, as technologists have also started performing Barium enemas without radiologist supervision.

However, information regarding the cost of the procedure and the cost saving impact of delegating this task was not accessible so more investigation would be required.

4. Patient Benefits

A recurrent theme in literature surrounding AP is the resultant improvement of patient care. As aforementioned, one of these benefits include decreasing radiologist workload, which ultimately leads to shorter waiting times for certain procedures (14). This patient benefit of minimized wait times was reinforced in the earlier example of PICC line insertions and is also seen for patients who undergo a Video Fluoroscopy Swallow Study performed by technologists independently at St. Michael's Hospital and Humber River Hospital. In addition to better access to healthcare, advanced practice models provide an increased quality of care in terms of accuracy and patient satisfaction (3, 9, 10, 11). For instance, a study in Denmark compared reporting accuracy of 500 radiographers and 500 trainee radiologists and revealed that radiographers were 5% more accurate than the trainees (9). Moreover, a separate study showed that when surveyed, patient satisfaction was high in radiographer/nurse-led treatments (10). In the Canadian context, the improvement of patient satisfaction was apparent in the case of VCUGs at Sick Kids Hospital. As mentioned, the radiographers performing the VCUGs noticed a difference in patient compliance and parent satisfaction when there was continuity of care with technologists and the patient did not have to wait for the radiologist after the catheter had already been inserted. Therefore, advanced practice radiography has potential to improve patient experiences in the Canadian health care system.

4. Radiologist Training

Another issue currently facing the Canadian healthcare system is a shortage of radiologists or medical students choosing to go into the field of radiology (15). In smaller diagnostic clinics, there tends to be fewer radiologists who are in charge of performing procedures as well as reporting on the cases. For this reason, some clinics are currently outsourcing and using offshore services (16). In this case, introducing APRTs in clinics could free up time for radiologists to continue reporting and working on other cases. Contrary to this, the technologists who were interviewed perceived that the APRT solution in some major hospitals to be ineffective, due to higher radiologists and residents' availability and willingness to do these procedures. These technologists commented that their

additional training would merely be taking up time that the radiologists require to train their residents and time residents would need to apply these skills on patients. This was observed in the transition from radiologists to technologists performing VCUGs, as they began to realize that some radiologists no longer feel comfortable performing these procedures and would rely on the technologists. Consequently, upskilling technologists to perform these procedures could come at the expense of reducing the competency of radiologists. Therefore, introducing APRT may be more effective at freeing their time in smaller clinics, rather than in larger hospitals, where there might already be several personnel who could perform these tasks.

5. Limits on Advancing Radiography

The surveyed technologists provided some illustrative examples of limitations to expansion of a radiographer's scope of practice. One of these limitations is that the technologists should only perform AP procedures in straightforward and non-critical cases. For example, at SickKids, the radiologists and trained Neonatal Intensive Care Unit Advanced Nurse Practitioners perform PICC lines placements due to their difficulty in pediatric patients. As a result, only one technologist is trained to insert PICC lines in pediatric patients in the Image Guided Therapy department, where the cases are considered more routine. Additionally, advanced skills acquired by radiographers should only be employed for the purpose of obtaining diagnostic images. An example provided by a Sick Kids technologist was that while a radiographer could be an expert at inserting catheters for VCUGs, they would have to refrain from aiding a physician struggling to insert the catheter in a trauma, since it would not be for diagnostic imaging. Another potential limit to expanding the radiographer role is resistance from technologists to increase their workload. For example, when it comes to technologists contributing to image evaluation, some interviewed technologists feel that it would not increase departmental efficiency since it may lead to increased patients' pre-exam wait time since technologists have to spend more time reporting, and the radiologists would have to confirm the report anyways. However, while the relationship between radiographer reporting and pre-exam wait times has not been studied in the literature, there are studies that show a decrease in report wait times where APRTs contribute to image evaluation and increased accuracy of the reports (9, 14). These limitations should

be considered in the development of an APRT role in Canadian healthcare.

6. Education and Training

A major component of the implementation of APRT roles in the Canadian healthcare system is the education and training required to achieve the title of APRT. UK advanced radiographers obtain a Master's degree for certification (8), consisting of 2 years in-class education, which would be valuable if the technologists were to perform procedures as well as contribute to the reporting process. This Master's degree would prepare technologists for advanced practice by providing training on advanced clinical skills, such as diagnostic image interpretation and advanced patient care, as well administrative and leadership skills (17). Alternatively, a diploma or certification program could be more appropriate for the training of these advanced procedures. When asked if they feel they should complete a Master's degree in order to obtain their AP certification to perform these procedures, there was mixed responses from the technologists. Some surveyed technologists agree that a Master's level of education would be beneficial for APRTs, while others suggested that site-specific training based on departmental needs could be sufficient. For example, the technologists at Sick Kids stated that VCUGs are not done in many hospitals and therefore it would not be advantageous for a technologist to become competent in performing VCUGs through a certification program, if the skills could not be regularly practiced enough to maintain competency. Another key point that was brought up was limiting the number of technologists who could perform these special procedures to ensure that the radiographer had sufficient hours of practice to retain the skill and become established in the procedure. These considerations for the education and training of APRTs another challenge in developing education and training associated with an APRT title is identifying specific procedures to include in a certification program, since each hospital has different procedure requirements and protocols that are available for technologists to perform independently and regularly. There are other procedures beyond those mentioned previously, including Nasojejunal and Nasogastric tube insertion that technologists and supervisors believe could greatly improve workflow if they were incorporated into the future APRT scope of practice. Further investigation would also need to go into potential increase in salaries, and the effect of that on the department, to compensate for the additional level of education for an APRT

certification. Overall, while the differences in education and training across practices may present challenges to the creation of a general APRT certification, it would be an important obstacle to overcome in order for the Canadian healthcare system to benefit from having APRTs.

7. Conclusion

Overall, the responses from the technologists support the development of a procedural-based APRT role in the Canadian healthcare system. The technologists that perform procedures independently already observe benefits of APRT that are discussed in literature, including reduced wait times for patients and improved patient care. However, potential risks and limitations, like reducing radiologist competency, were mentioned and should be further explored so as to minimize them as much as possible. The technologists also shed light on investigation that would need to be done prior to implementation, such as the educational requirements for certification and choosing certifiable advanced practice procedures. Despite these potential barriers, advanced practice for radiological technologists offers many potential benefits to the Canadian healthcare context.

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APPENDIX A: Survey

Hello,

Thank you for agreeing to participate in this survey. The purpose of this survey is to gain perspective on the potential role and implications of Advanced Practice Technologists on the Canadian health care system by studying procedures beyond the MRT scope that are already being carried out by technologists independently.

Answers to this survey may be included in a paper that is submitted for the CAMRT Competitive Awards.

Please answer the following questions in as much detail as you can.

Please indicate if you would like your responses to be anonymous.

Y or N

1. Please list the current procedures, usually conducted by radiologists, that technologists have learned to carry out independently. What was the process for technologists to gain competency to do these procedures?
2. Is there any technologist resistance to doing these procedures independently? If so, why?
3. How does carrying out these procedures affect your workload and the workflow of the department?
4. What benefits or risks to the patients undergoing these procedures have you observed?
5. Do you think the department could benefit from advanced practice technologists (technologists who completed a Master's level of training in advanced practice roles)? Why or why not?