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Development, Implementation, and Outcomes of an Acute Care Clinician Scientist Clinical Placement: Case Report

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ABSTRACT

Purpose: This article presents the development, implementation, and outcomes of an innovative clinician scientist (CS) placement for a 2nd-year, entry-level MSc(PT) student at McMaster University. **Client Description:** All physiotherapy students participating in the third 6-week clinical placement at McMaster University were eligible to apply for one CS placement. A placement description and expectations were developed collaboratively by the clinical site and the MSc(PT) programme before placement matching. **Intervention:** A shared supervisory model between one acute care physiotherapist and a critical care CS was developed to provide supervision in both clinical and research-related activities during the placement. **Measures and Outcomes:** The first CS clinical placement in the MSc(PT) Program at McMaster was completed between November and December 2015. The student was evaluated using the same process as a traditional student placement. Over 6 weeks, the student gained clinical experience in an acute care setting; accumulated more than 100 cardiorespiratory hours; participated in research activities for a randomized controlled trial, which led to a submission to *Physiotherapy Practice*; and applied for the Canadian Institutes of Health Research Health Professional Student Research Award. **Implications:** The CS is a developing role for Canadian physiotherapists. A CS placement gave the physiotherapy student the opportunity to apply traditional skills and knowledge as well as to develop advanced research skills. The success of this placement has established a foundation for future placements.

Key Words: case report; internship; critical care; clinical research.

RÉSUMÉ

Objectif : présenter la préparation, la mise en œuvre et les résultats d'un stage novateur de chercheur clinicien (CC) offert à un étudiant de deuxième année à la maîtrise ès sciences en physiothérapie de l'Université McMaster. **Description des clients :** la description et les attentes du stage ont été établies par le lieu du stage et le programme de maîtrise en physiothérapie avant le processus d'attribution des stages. Tous les étudiants en physiothérapie qui participaient au troisième stage de six semaines de l'Université McMaster pouvaient poser leur candidature à un stage de CC. **Intervention :** un modèle de supervision partagé entre un physiothérapeute en soins aigus et un CC en soins critiques a été préparé pour assurer la supervision des activités cliniques et de recherche pendant le stage. **Mesures et résultats :** le premier stage de CC au programme de maîtrise en physiothérapie de l'Université McMaster a eu lieu en novembre et décembre 2015. L'étudiant a été évalué selon les mêmes processus que s'il avait suivi un stage ordinaire. Pendant six semaines, il a acquis une expérience clinique en soins aigus, accumulé plus de 100 heures en soins cardiorespiratoires, participé à des activités de recherche en vue d'un essai aléatoire et contrôlé, piloté la soumission d'un manuscrit à *Physiotherapy Practice* et demandé une bourse de recherche pour les étudiants en santé des Instituts de recherche en santé du Canada. **Répercussions :** le rôle de CC est en croissance chez les physiothérapeutes canadiens. Un stage de CC a permis à l'étudiant en physiothérapie de mettre en pratique les habiletés et compétences habituelles et d'acquérir des compétences de recherche avancées. La réussite de ce stage a jeté les bases de futurs stages.

Approximately 50% of health professional education occurs outside the classroom, in practice settings.¹ Clinical education, or learning in practice settings, facilitates students' development into safe and effective practitioners.¹ In addition, clinical education can expose students to

different career paths. One example of an alternative career path emerging for physiotherapists in Canada is that of clinician scientist (CS).² A CS has a unique combination of skills that facilitates the development of research questions based on clinical issues encountered in

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practice and the ability to translate research results to the clinical setting.³ CSs are positioned to help close the gap between research and practice, and they are critical for driving health care innovation in Canada.³

The CS is frequently identified in the medical literature^{3,4} as a clinician who works in the clinical setting, has typically undertaken additional research training, and dedicates a substantial part of his or her career to research. As both a clinician and a researcher, a CS plays a central role in discovering and translating health-related knowledge.³ In the physiotherapy literature, however, the CS is rarely discussed and could be considered an emerging role for Canadian physiotherapists.

Role-emerging (RE) placements provide students with clinical education opportunities and challenge students to learn about programme development and non-traditional physiotherapy roles.⁵ RE placements also provide an innovative way to train students to deliver cost-effective and safe care. Thus, an RE placement can be an ideal way for a physiotherapy student to learn about the CS role as a potential career option and contribute to an emerging area of physiotherapy practice.

This case report was exempt from the formal ethics review process because of the nature of its content.

CLIENT DESCRIPTION

We established an acute care physiotherapist CS position at McMaster University in 2015 through a collaborative partnership between the School of Rehabilitation Science and St. Joseph's Healthcare Hamilton (St. Joe's). St. Joe's is a tertiary academic teaching facility affiliated with the institution, and it has offered physiotherapy clinical placements for more than 20 years. The physiotherapist CS (MEK) is a tenure-track faculty member at McMaster and provides 20% clinical service in the intensive care unit (ICU) at St. Joe's. She teaches in the McMaster MSc(PT) programme and leads clinical research for critically ill patients in the St. Joe's ICU. Building on this partnership, we developed a 6-week pilot CS RE placement in fall 2015.

The physiotherapy department manager at St. Joe's (BC), the director of clinical education (DCE) for physiotherapy at McMaster University (SW), a senior acute care physiotherapist at St. Joe's (MM), and the physiotherapist CS (MEK) collaboratively developed a detailed placement description and expectations (see Appendix 1 online). The team determined that a shared model of supervision, with two clinical instructors for one student (also known as a "two:one model") would allow for a full-time CS placement (i.e., 37.5 hr/wk for 6 wk). The team also selected this model to ensure that the student would receive ample opportunities to complete research during the placement and a minimum of 100 cardiorespiratory practice hours to satisfy one of the MSc(PT) programme graduation requirements at McMaster.

INTERVENTION

Matching the placement

We modified the application and matching process for this placement from that for a traditional placement. Students interested in participating in the CS placement answered a series of questions and ranked the placement (see Appendix 1 online). We required students to acknowledge that this placement required a flexible working schedule to participate in research meetings and presentations, which occasionally occurred outside traditional placement hours (i.e., early morning or evening); expectations for research contributions, which would vary depending on submission deadlines; and decreased clinical time compared with a traditional placement. The DCE (Physiotherapy) reviewed the applications and student rankings to identify a student match.

The successful student ranked the placement first and clearly articulated her goals, personal strengths, and opportunities for growth. These goals included an interest in pursuing postgraduate work after completing her MSc(PT) degree. The student had previous experience in completing literature reviews, collecting data, and carrying out knowledge translation activities as a research assistant before entering the MSc(PT) programme. After completing the placement, the student provided consent for the case report to be written and submitted for publication.

Implementing the placement

The CS placement occurred during the first placement of the 2nd year, after students learned basic orthopaedic, cardiorespiratory, and neurological physiotherapy practice in addition to basic research skills. To facilitate orientation to the acute care facility, the 1st day of placement was completely clinical. The senior physiotherapist had daily contact with the student, providing 4 hours of supervision in the acute care unit every morning. The student met with the physiotherapist CS once a week for formal updates but was expected to complete the majority of research activities independently. There were, however, a few days when the student travelled with the physiotherapist CS to participate in research presentations, and the student needed to arrange for the senior physiotherapist to cover her caseload for those days. The importance of integrating the clinical and research context of the placement was emphasized to the student by both the senior physiotherapist and the physiotherapist CS over the course of the placement.

MEASURES AND OUTCOMES

Measures

Learning contracts are a mandatory evaluation component of all clinical placements for MSc(PT) students at McMaster. The student submitted a learning contract

with four clinical and four research goals that were specific, measurable, assignable, realistic, and time related (i.e., SMART goals). Appendix 2 online provides an overview of the goals agreed on by the two clinical instructors (CIs) and the student during the 1st week of the placement (full learning contract available on request). The student was also evaluated using the Clinical Performance Instrument (CPI; 1997 version).⁶ The CPI was not modified, and the student was evaluated on all domains at the final evaluation. Both CIs discussed, collaboratively completed, and reviewed the evaluation with the student using the learning contract and the CPI at mid-term (wk 3) and final (wk 6). The student submitted a written reflection and provided verbal feedback to both CIs at the final evaluation.

Outcomes

By the end of the 6-week clinical placement, the student was able to independently implement the study research protocol, had submitted an article to *Physiotherapy Practice*⁷ about the technology used in the study, and submitted an application to the Canadian Institutes of Health Research Health Professional Student Research Award. The student also participated in one knowledge translation presentation at the hospital, which reported preliminary protocol-adherence data on the use of in-bed cycling with critically ill patients. By the final evaluation, the student successfully completed all SMART learning objectives established during the 1st week of the placement in collaboration with the physiotherapist CS and the senior (see Appendix 2 online). The student received ratings of at least 7.5 or higher on every 10-point visual analogue scale question on the CPI. Neither the senior physiotherapist nor the physiotherapist CS expressed concern about using the CPI in an unmodified state.

The following sets out views on the placement from different perspectives. (Appendix 3 online outlines the placement structure and outcomes.)

Reflections of the student

In general, the student found that the CS RE placement was similar to other traditional placements. For example, every morning the student assessed and treated patients with a variety of acute conditions under the supervision of the senior physiotherapist, communicated with members of the interdisciplinary team, and completed required patient-care-related tasks, such as discharge planning and team rounds. The student developed time management skills and learned how to bridge the gap between active research and clinical implementation. Specifically, the student acknowledged,

This placement provided an opportunity for me to be part of both clinical and academic worlds simultaneously. The placement helped me understand how researchers can develop studies that are feasible for clinicians to implement as part of their daily responsibilities and how

clinical treatments that are based on research can be implemented in the clinical setting. Completion of this placement reinforced my desire to pursue a physiotherapist CS role post-graduation.

Perspective of the physiotherapist CS

The placement was successful and exposed the student to core research activities, including contributing to original clinical research by implementing a study protocol and participating in data collection, writing for scholarly and grant purposes, and carrying out knowledge translation activities (e.g., making research presentations to clinical staff, participating in meetings with the research and clinical teams).

Perspective of the senior physiotherapist

The senior physiotherapist provided direct supervision of the student every morning during clinical care. At the end of the placement, this physiotherapist noted that the placement had challenged the student's time management, adaptability, and organizational skills. In particular, the senior physiotherapist noted that the student had to quickly develop the ability to complete her clinical responsibilities in the time allocated, including managing her caseload by assigning patients. Time management was important to ensure that the student could be present and participate in the scheduled research activities.

Several factors contributed to the success of this placement: extensive preparation, including a clear placement overview, careful student matching, and ongoing communication between the physiotherapist CS and the senior physiotherapist. In addition, the relationship between St. Joe's and the McMaster physiotherapy programme, support from hospital management, and the student's positive attitude and aptitude for research were essential to the success of this placement.

IMPLICATIONS

As health care systems evolve in response to a climate of fiscal and demographic challenges, the opportunities for clinical education have changed,¹ and fewer opportunities exist for rehabilitation students in acute care settings. This places increased pressure on academic programmes to fulfill clinical education requirements.¹ This pressure, along with an exponentially growing health professional knowledge base and increasing employer expectations that educators adequately prepare students for integration into the "real life" of clinical practice,⁸ requires universities to develop innovative and cost-effective approaches to training students to deliver safe and high-quality care.⁹ This RE placement provided a physiotherapy student with the opportunity to learn about a career as a CS as well as contribute to an emerging area of physiotherapy practice.

RE placements are one practical way of helping students experience the CS role firsthand. However, it is

currently unknown how many opportunities exist for physiotherapist CSs in Canada or whether these physiotherapists can support clinical placements. Although there are signs that more individuals are pursuing CS careers and that funding to CSs increased between 2000–2001 and 2008–2009,⁹ we do not know how many of these CS positions were physiotherapy specific. Future research is required to understand exactly how many physiotherapists in Canada are employed in CS positions and how well they can support student clinical placements as a result of questionable sustainability.³ As a result, academic clinical coordinators and directors of clinical education will need to work closely with community partners to identify whether CS placement opportunities can be developed and sustained in the current clinical climate. Qualitative research with physiotherapists in CS roles nationally and internationally may also provide insight into the barriers to and facilitators of sustaining CS clinical placements in the future.

If a CS role is not available, or if the stability of the role is uncertain over the course of the placement period, alternative supervision strategies may exist to give students a similar experience. For example, a feasible alternative may be to place a student part time with a practising clinician and part time with a physiotherapist researcher studying in the same clinical area. It is unknown how widely this model is currently used in clinical education for physiotherapy students. Future research could include surveying all physiotherapy programmes in Canada to identify the extent to which this placement model is used and its perceived value for encouraging recruitment to and retention in the CS role in physiotherapy. This model could also serve to connect clinicians and researchers with similar interests and strengthen relationships between physiotherapy programmes and clinical affiliates.

Case reports have inherent limitations. For example, findings may not be generalizable because they do not establish a cause–effect relationship, and they do not identify a representative population for which their findings are valid.⁹ In addition, case reports are retrospective and subjective, which can result in recall bias and information bias, respectively.⁹ These same limitations apply to this case report.

This placement was successful because of the availability of appropriate activities that could be completed by the student during the placement time frame. These activities included contributing to an invited article for *Physiotherapy Practice*,¹⁰ writing a relevant grant application, and participating in an ongoing, actively enrolling clinical trial.¹¹ We realize that these opportunities may not be available for all CS placements and that more research is required to identify whether this placement model can apply to other physiotherapy programmes.

CSs are integral to the discovery and translation of health-related knowledge. The CS role is emerging for Canadian physiotherapists, and it has the potential to

influence and direct high-quality patient care and innovation in the physiotherapy profession. This case report described a CS placement for an entry-level physiotherapy student. This placement was an opportunity for the student to apply traditional skills and knowledge while developing skills related to implementing a randomized controlled trial in a clinical environment, collecting data according to study protocols, and writing an article for a scholarly journal.

Future research is required to determine whether student participation in a CS placement influences post-graduation career choices. This could be achieved by prospectively following physiotherapy students who have completed a CS placement to determine whether participation in the CS placement results in a choice of a CS career after graduation. Our goal is to offer a similar placement annually at St. Joe's, and the processes and lessons learned from this placement will inform future placements, ideally in different patient populations and disciplines (e.g., occupational therapy, speech-language pathology).

KEY MESSAGES

What is already known on this topic

Role-emerging placements⁶ provide clinical education opportunities while challenging students to learn about programme development and non-traditional physiotherapy roles. The clinician scientist (CS) is frequently identified in the medical literature,^{3,4} but not in the physiotherapy literature.

What this case study adds

We described a hospital–university collaborative development of a physiotherapy CS placement for a 2nd-year physiotherapy student at McMaster University. We offer a framework for other physiotherapy and rehabilitation programmes to establish innovative and cost-effective approaches to training students.⁸

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