Development and Early Evaluation of an Inter-professional Post-licensure Education Programme for Extended Practice Roles in Arthritis Care

Katie Landon, Rachel Shupak, Rayfel Schneider, Jodi Herold McIlroy

ABSTRACT

Purpose: The Advanced Clinician Practitioner in Arthritis Care (ACPAC) Program was developed to train experienced physical and occupational therapists within extended practice roles with the aim of facilitating optimal, timely, and appropriate delivery of health care to patients with arthritis. This paper presents (1) the development of the ACPAC Program and (2) performance across the programme, as well as early quantitative and qualitative changes in clinical practice roles for the 2006 through 2008 cohorts of ACPAC Program graduates ($n = 19$).

Methods: Measurement of change in skills and knowledge involved standardized baseline and end-of-programme examinations as well as self-evaluation of a number of areas of clinical competence. Practice-focused surveys issued at baseline, mid-programme, and end of programme, as well as at 6 and 12 months after graduation, evaluated the practitioners' integration of advanced knowledge and skills acquired during the ACPAC Program into their extended practice roles.

Results: Participants significantly increased their scores on examinations of clinical knowledge ($p < 0.001$) and skills ($p < 0.001$) from baseline through programme completion. There was an increase in frequency of performance of clinical tasks and assumption of responsibilities related to their extended practice roles from the beginning to the end of the programme. The five areas that changed in relation to these new roles were increased clinical responsibilities, efficiencies in practice settings, roles as educational leaders and mentors in the field of arthritis care, inter-professional collaboration, and improved access to care for patients with arthritis, particularly in remote areas.

Conclusion: Graduates of the ACPAC Program have demonstrated knowledge and skills for practising in extended roles that enhance the available human health resource pool for patients with arthritis.

Key Words: arthritis care, extended practice roles, inter-professional education, extended-role practitioner, post-licensure training

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RÉSUMÉ

Objectif : Le programme de pratique clinique avancée pour le soin de l'arthrite (Advance Clinician Practitioner in Arthritis Care Program, ou ACPAC) a été créé pour former des physiothérapeutes et des ergothérapeutes d'expérience à des rôles élargis dans la pratique avec comme objectif de favoriser une prestation optimale, appropriée et en temps opportun de soins de santé aux personnes qui souffrent d'arthrite. Cet article traite premièrement de la création du programme ACPAC, et deuxièmement du rendement de ce programme ainsi que des changements qualitatifs et quantitatifs dans les rôles cliniques pour les cohortes initiales de diplômés au programme ACPAC, de 2006 à 2008 ($n = 19$).

Méthode : La mesure des changements dans les compétences et les connaissances impliquait des examens de base normalisés et des examens en fin de programme, de même que l'autoévaluation pour un certain nombre de secteurs de compétence clinique. Des sondages sur la pratique ont été réalisés au début, au milieu et à la fin du programme, de même que 6 et 12 mois après l'obtention du diplôme. Ils avaient comme objectif d'évaluer, chez les praticiens, le degré d'intégration des compétences et des connaissances avancées acquises durant la formation au programme ACPAC à leur nouveau rôle plus étendu dans la pratique.

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Katie Landon, BScPT, MSc, PhD: Assistant Professor, Department of Medicine, Faculty of Medicine, University of Toronto; ACPAC Program Coordinator, St. Michael's Hospital, Toronto, Ontario.

Rachel Shupak, MD, FRCP (c): ACPAC Program Director, St. Michael's Hospital, Toronto, Ontario.

Rayfel Schneider, MBCh, FRCP(c): Pediatric Training Program: ACPAC; Associate Chair, Education, Department of Paediatrics, University of Toronto; Staff Rheumatologist, Hospital for Sick Children, Toronto, Ontario.

Jodi Herold McIlroy, BSc(PT), MA, PhD: Assistant Professor and Scientist, Wilson Centre for Research in Education, University of Toronto, Faculty of Medicine; University Health Network, Toronto, Ontario.

Address correspondence to *Katie Landon*, Department of Medicine, University of Toronto, ACPAC Program Coordinator, St. Michael's Hospital, Room 3020, 30 Bond Street, Toronto, ON M5B 1W8 Canada; Tel.: 416-864-5068; Fax: 416-864-5549; E-mail: lundonk@smh.toronto.on.ca.

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Résultats : Entre le début et la fin du programme, les notes des participants aux examens ont considérablement augmenté en ce qui a trait aux connaissances cliniques ($p < 0,001$) et aux compétences ($p < 0,001$). Pour la même période, on a également constaté une augmentation de la fréquence dans l'exécution de tâches cliniques et de responsabilités liées au rôle de pratique étendu. Les cinq points qui ont changé dans le cadre de ces rôles sont les responsabilités cliniques plus importantes, l'efficacité dans le cadre de pratique, le rôle des participants, devenus formateurs informels et mentors dans le domaine des soins de l'arthrite, la collaboration interdisciplinaire et un meilleur accès aux soins pour les patients qui souffrent d'arthrite, surtout en région éloignée.

Conclusion : Les diplômés au programme ACPAC ont fait la preuve qu'ils possédaient les connaissances et les compétences pour élargir leur rôle de praticien et contribuer ainsi à accroître le nombre de professionnels de la santé disponibles pour les patients qui souffrent d'arthrite.

Mots clés : éducation interdisciplinaire, formation après permis d'exercice, praticien à rôle étendu, rôle accru dans la pratique, soins de l'arthrite

INTRODUCTION

The Advanced Clinician Practitioner in Arthritis Care (ACPAC) Program is an innovative clinical and academic training program hosted by St. Michael's Hospital (adults) in collaboration with the Hospital for Sick Children (paediatrics) in Toronto, Canada. It is offered through the Faculty of Medicine of the University of Toronto as a continuing education and professional development (CEPD) certificate and is a competency-based inter-professional programme for adult learners¹ delivered in episodic format, 1 week per month, across a 10-month period each year. The programme focuses on advanced assessment, diagnosis, triage, and independent management of selected arthritis disorders. One goal of the ACPAC Program is to prepare experienced practitioners in physical therapy (PT) and occupational therapy (OT) for extended practice roles, enabling timely and improved delivery of health care to patients with selected arthritis disorders across diverse clinical settings in the province of Ontario. The programme's second goal is to facilitate the translation of new knowledge into practice and thus to promote the development of new models of inter-professional patient-centred care for patients with arthritis.

The ACPAC Program was built on the foundation of a precursor training programme that operated in 1995 ($n = 1$ PT) and 2001 ($n = 3$, 1 OT and 2 PTs) to train extended-practice practitioners in paediatric rheumatology at the Hospital for Sick Children.² A feasibility study conducted in 2002 determined that a similar model could be applied to an adult rheumatology population within an academic teaching hospital.³ The ACPAC Program was formally developed in 2005 to address (1) the recognized need for an inter-professional approach to manage patients with rheumatoid arthritis (RA) and osteoarthritis (OA) more efficiently^{4,5} and (2) impending human health resource issues in the context of a progressive decline in the number of traditional (physician) arthritis care specialists.⁶

The development of inter-professional models of education and care in chronic disease management is of current interest.⁷ There is specific evidence that an inter-professional approach optimizes the management of patients with RA and OA and is associated with out-

comes of decreased pain, improved function, and overall improved health in this population.^{4,5} The decline in the traditional human resources available to care for the expanding population presenting with chronic musculoskeletal diseases⁶ will continue to cause difficulties in access to care, early diagnosis, and effective interventions, particularly in remote or under-served areas.⁸ In light of this shortage, the idea that meeting the needs of patients with arthritis requires crossing traditional professional boundaries in order to optimize scarce human health resources has become more viable.

In the past two decades, new models of arthritis care have been developed successfully (largely in the United Kingdom and Canada) by incorporating extended-practice physical therapists in the delivery of musculoskeletal^{9–14} and arthritis care.^{2,15–17} These initiatives have generally resulted in better patient education,¹⁷ improved patient management and efficiency,^{10,18–21} and high levels of patient satisfaction.^{16,22} While the concept of extended practice roles for clinicians and their circumstantially based benefits are documented internationally, the literature is lacking in evidence of formal, standardized, competency-based training programmes with strong evaluative components used to train these practitioners. In the absence of a standardized, competency-based programme, no outcome data are available to describe trainees or programmes, which further limits the evaluation of practitioner roles, particularly in relation to their training experiences.

The objectives of this paper, therefore, are

1. to describe more fully the development and inception of the Advanced Clinician Practitioner in Arthritis Care (ACPAC) Program; and
2. to report performance across the programme as well as early quantitative and qualitative changes in clinical practice roles for the 2006 to 2008 ($n = 19$) cohorts of ACPAC Program graduates.

METHODS

Development and Inception of the ACPAC Program

The vision for the ACPAC Program was formulated under the leadership of two academic rheumatologists (the adult and paediatric programme directors) and a

physical therapist with a PhD in bone pathophysiology (the programme coordinator), who have worked collaboratively to direct and coordinate the programme since its inception. In order to realize the ACPAC Program, these key leaders sought and secured both funding and institutional support for an initial 2-year period. Once funding and support were in place, the critical next steps included delineating the ACPAC Program objectives and expected competencies that would reflect the ACPAC trainee's ability to engage in advanced assessment, diagnosis, triage, and independent management of patients with selected arthritis disorders. ACPAC Program content and format of delivery were then determined. Health care professionals who were content experts in arthritis care were approached to contribute to the curriculum, and a steering committee was convened to provide guidance as the programme developed and evolved. Criteria for admission to the ACPAC Program and modes of programme evaluation were then considered. CEPD accreditation within the Faculty of Medicine, University of Toronto, was sought prior to the implementation of the programme.

ACPAC Program Evaluation

Ethics approval was not required for this study because quality-assurance studies, performance reviews, and testing within normal educational requirements at the University of Toronto do not require review by the Research Ethics Board.²³ In this study, the ACPAC education programme was assessed using three of Dixon's four levels of criteria for programme evaluation: level 1—reaction; level 2—competency; and level 3—clinical practice (see Table 1).²⁴ Learners were surveyed at the midpoint and at the end of their training to gauge their satisfaction with the ACPAC Program (Dixon's level 1—reaction), in particular the extent to which it met its stated objectives, its relevance to practice, and its potential to change their future performance.

The impact of the ACPAC Program on the clinical knowledge and skills (Dixon's level 2—competency) of the 2006, 2007, and 2008 cohorts of ACPAC Program graduates was evaluated by examining change in perfor-

mance on the written and practical skills examinations from baseline (pre-programme) to end of programme. Level 2 was also assessed using self-evaluation surveys completed by trainees at baseline, midway through the programme, and at programme's end, as well as 6 and 12 months after graduation. These surveys asked trainees to rate their own level of ability, using a five-point scale (1 = poor, 5 = excellent), on 11 aspects of advanced clinical knowledge and skills relating to arthritis care: data gathering, technical and procedural skills, diagnosis, and treatment and management (in both adult and paediatric populations), as well as collaborative skills, self-reflection, and self-assessment (general).

Extensive practice-focused surveys asked practitioners to identify the frequency with which they executed a series of clinical tasks and procedures (e.g., performing a history and physical exam; interpreting clinical, lab, and radiographic data; initiating treatment and management; follow-up and monitoring of treatment; monitoring of medications and complications; delivering patient education) in a large number of clinical conditions relevant to the competencies and content of the ACPAC Program. These self-report surveys were used to determine change in practice patterns as practitioners implemented their learning in the clinical setting (Dixon's level 3—clinical practice) and to examine the development of trainees' extended practice roles and responsibilities throughout the ACPAC Program and by 12 months after graduation.

In the 6- and 12-month follow-up surveys, additional open-ended questions probed the changes in nature and frequency of clinical tasks and responsibilities, changes in job description (including title and salary), whether graduates ever worked beyond their scope of practice, whether there was greater autonomy in their practice settings, and whether they saw more people with arthritis because of their training. In addition, ACPAC Program trainees were asked to fill in tables at baseline identifying the nature of their clinical setting, basic job description, and responsibilities in arthritis care; at 6 and 12 months following graduation, graduates were asked to reflect upon this baseline information and spontaneously report on and give examples of changes in their clinical setting in terms of their role in development of new models of care, clinic operation and/or efficiency changes, changes in job description, changes in responsibilities within institutions, wait-list management, access to care, quality of care delivered, and cost-saving measures. General themes relating to the ACPAC-trained practitioner's extended practice roles that were common to all clinical settings were distilled from this information.

Analysis

Changes in written (knowledge) and practical (skills) exam scores were analyzed using paired *t*-tests. Self-

Table 1 Early Evaluation of the ACPAC Program Using Three of Four Levels of Dixon's²⁴ Framework for Assessing Outcome in Health Education

<i>Evaluation Level</i>	<i>Description</i>
1. Reaction	Reaction to the educational experience: satisfaction and relevance
2. Competency	Change in the skills, knowledge, or attitudes of the learner as a result of the experience
3. Clinical Practice	Extent to which change in professional behaviours in actual clinical work occurred as a result of the experiences
4. Health Care Outcomes	Impact on patient status as a result of the experience

evaluation data were analyzed to assess the significance of changes from baseline through 12-month follow-up using the Kruskal-Wallis test for independent samples.

Self-reported frequency of performance of clinical tasks at baseline, mid-programme, end of programme, and 6- and 12-month follow-up were analyzed using descriptive and graphical analysis.

RESULTS

Development and Inception of the ACPAC Program

The ACPAC Program was established in March 2005 as a 2-year pilot clinical and academic training programme hosted at St. Michael's Hospital in collaboration with the Hospital for Sick Children. Initial funding for the inception and operational costs of the programme was secured from both private (industry) and public (St. Michael's Hospital and its foundation) sources. There was further in-kind support for accommodation and travel of trainees employed by the Arthritis Society, Ontario Branch, as well as a small tuition fee charged per trainee, paid by their supporting institutions. In 2007, the ACPAC Program was endorsed and supported as a HealthForce Ontario Initiative and received funding from the Ontario Ministry of Health and Long-Term Care for a renewable 3-year period.

Program Objectives and Competencies

Eight specific objectives of the ACPAC Program are presented in Table 2. The trainee competencies were de-

lineated and developed based on selected post-graduate medical training competencies from the specialist fields of adult and paediatric rheumatology.²⁵ The multi-disciplinary core curriculum for musculoskeletal health²⁶ and competencies for the arthritis-care specialist with a rehabilitation background²⁷ were also used as reference points. Each competency was then matched with an appropriate learning opportunity and evaluation method. Expectations for increased clinical responsibilities in the extended practice role included performing the initial assessment of a patient with undiagnosed arthritis (inflammatory or non-inflammatory), initiating orders for laboratory testing or diagnostic imaging, interpreting laboratory or diagnostic imaging test results, giving a differential diagnosis, and independently managing and monitoring follow-up for patients with an array of arthritis conditions. For example, the practitioner was expected to identify "red flags" generated from taking an advanced history and to initiate laboratory investigations based on systemic symptoms such as fever and weight loss or multi-system disease involving skin, lungs, gastrointestinal, neurological symptoms, and muscle weakness. The practitioner was expected to interpret abnormal laboratory findings based on complete blood count (CBC), high erythrocyte sedimentation rate (ESR), C-reactive protein (CRP), abnormal urinalysis, liver function tests (LFT), creatine kinase (CK) elevation, and abnormal proteins, all in the context of polyarthritis.

Program Content and Design

The ACPAC Program was designed in an episodic format, offered 1 week per month over a 10-month period; the academic and clinical curriculum was organized to optimize desired skills and knowledge (competencies) to be learned and/or achieved. The five content modules were Basic Science Theory Underlying Musculoskeletal Practice (58 hours); Foundations of Clinical Practice (64 hours); Therapeutic Management (54 hours); and The Art and Science of Clinical Practice, which included both a core rheumatology module (minimum 80+ hours) and another module encompassing two or more clinical electives (minimum 80+ hours) related to musculoskeletal and arthritis care (see Figure 1).^a The clinical hours in the core rheumatology module included a mandatory minimum of three paediatric rheumatology clinics. The clinical electives module included a choice of at least two of osteoporosis, foot and ankle, hand, upper extremity (shoulder and elbow), ankylosing spondylitis, haemophilia, dermatomyositis and juvenile dermatomyositis, spine, orthopaedic arthritis care, and lower extremity (hip and knee) clinics.

Table 2 The ACPAC Program: General Objectives

ACPAC Program Objectives

1. To offer a curriculum of standardized, current post-licensure-level basic science, clinical science, and therapeutic management learning experiences as they relate to the arthritis care field.
2. To facilitate the participant's learning of best practices through extensive clinical experience in the arthritis care field.
3. To develop and prepare practitioners (physical and occupational therapists) to be competent, independent clinicians who engage in extended practice roles in selected areas of arthritis care.
4. To develop and prepare practitioners (physical therapists and occupational therapists) to triage patients with osteoarthritis and inflammatory arthritis.
5. To create a novel model of arthritis management and care in Ontario that optimizes scarce health care resources by utilizing selected, highly trained health professionals to promote and implement inter-professional patient-centred care.
6. To improve accessibility to arthritis care in outreach areas of Ontario as a result of the participant's expanded ability to identify, assess, and manage (treatment and referral) select disorders associated with these conditions.
7. To develop and prepare the ACPAC-trained practitioners to become leaders in inter-professional patient-centred education and care in the management of arthritis conditions.
8. To gain insight into the extended practice role that the ACPAC-trained practitioners will play in service delivery, as well as into the barriers that may exist to impede the implementation of this practice.

a. Further detail on specific module content can be accessed through the ACPAC Program Web site at <http://www.stmichaelshospital.com/programs/mobility/acpac.php>.

FOUNDATION OF ACPAC CURRICULUM: ACADEMIC/CLINICAL

Figure 1 ACPAC Program modules: Academic and clinical content

Faculty

At least 60 faculty representing multiple health professions with expertise in arthritis care (see Table 3) were recruited from academic and non-academic health care centres across the Greater Toronto Area, as well as from the Arthritis Society, Ontario Branch, to deliver the clinical and academic content of the programme. More than 85% of the academic curriculum was initially delivered by rheumatologists, orthopaedic surgeons, and other physicians with an interest in arthritis care, with progressive involvement from the increasing cohort of ACPAC Program graduates over time.

Steering Committee and Outreach

A steering committee was convened to guide the process of programme implementation, administration, and support on a periodic basis. This committee was composed of members from hospital administration, paediatric and adult rheumatology (programme medical directors), academia/rehabilitation (programme coordinator), community (The Arthritis Society), and industry. Meetings were conducted on an as-needed basis with representatives from relevant professional regulatory

bodies and with Ontario's assistant deputy minister of health in order to maintain transparency during the development, inception, and operation of the programme.

ACPAC Trainee Criteria

As part of the criteria for admission, OT and PT candidates provided a *curriculum vitae* showing evidence of at least 5 years' post-licensure practice in the musculoskeletal field and at least 2 years' clinical experience in arthritis care. In addition to two clinical reference letters, a letter delineating the candidate's vision of working in a new extended practice role and another letter from the participant's institution promising financial support for the trainee for the duration of the programme were required. A separate letter of support describing the new role and position to be assumed by the ACPAC Program graduate was required from the administrator at each sponsoring institution.

Prospective trainees were interviewed by the programme directors and programme coordinator in the June preceding each training year. The first cohort of five trainees (3 PTs and 2 OTs) was accepted into the programme in September 2005; the second cohort (4 PTs and 1 OT) was accepted in September 2006; and a third cohort (9 PTs) was accepted in September 2007. In 2006–2007, three additional participants who had trained in the Practitioner in Paediatric Rheumatology programme at the Hospital for Sick Children in 2001² enrolled in only the orthopaedic (theory) component of the ACPAC Program.

Trainee Evaluation

Standardized baseline and end-of-programme theory (written) evaluations and five-station objective structured clinical examinations (OSCEs) were designed to assess the programme competencies. The written exams and OSCEs were developed by content experts who are teaching faculty in the programme and are representative of the scope of the content being taught. In addition,

Table 3 The ACPAC Program: Faculty Involved in the Delivery of Curriculum by 2008

Physicians		Other Health Professionals	
Adult Rheumatologists	8+	PhD/PTs or OTs (basic science, clinical epidemiology)	3
Paediatric Rheumatologists	6	PT/OT Extended-Practice Practitioners	8
Paediatric Endocrinologist	1	Dietitians	2
Orthopedic Surgeons	10	Pharmacists	2
Physiatrist	1	Social Workers	2
Plastic Surgeons	2	Information Specialist	1
Psychiatrist	1	Nurses	2
General Internists	5		
Radiologists	5		
Pathologists	2		
Anaesthetists	2		

trainees were required to complete case-report write-ups ($n = 5$), self-directed portfolio / structured learning projects, problem-based learning case vignettes, clinical performance appraisals, and a final 360° evaluation (also known as multi-source feedback). Clinical performance appraisals required trainees to solicit evaluations from members of the health care team, including orthopaedic surgeons and rheumatologists as well as some extended-practice practitioners who had graduated from the ACPAC Program and had had significant clinical exposure to the current trainees during the programme. Each trainee was required to achieve a minimum of 70% and/or to meet expectations in each evaluation category in order to graduate from the programme. CEPD accreditation within the Faculty of Medicine, University of Toronto, was sought and obtained prior to the commencement of each programme year.

ACPAC Program Evaluation

Between 2005 and 2008, 18 physical therapists and 4 occupational therapists completed the ACPAC Program. Three of these graduates had trained in the Practitioner in Paediatric Rheumatology programme at the Hospital for Sick Children in 2001,² and as they were required to complete only the orthopaedic (theory) component of the ACPAC Program, they are not included in the results reported here.

Level 1 Evaluation

All participants (100%) stated that the course was relevant to their practice, met stated objectives, and would alter their future practice performance. All trainees reported that the ACPAC Program altered their practice performance during the 12-month training period, expanded their knowledge across a broader range of diagnoses in relation to assessment, improved their clinical skill levels in all areas, and allowed them to better understand clinical presentations and potential complications of patients' disease profiles within the field of arthritis care.

Level 2 Evaluation

The average increase in knowledge from baseline to end of programme was 20% (paired $t_{18} = 9.5$, $p < 0.001$); the average improvement in skills was 23% (paired $t_{18} = 9.6$, $p < 0.001$; see Figure 2).

Growth was also seen in self-assessment of advanced clinical knowledge and skills required for extended practice roles in arthritis care in the adult population from pre- to post-programme, with most improvements sustained at 12 months following graduation for the 2006–2008 cohorts (see Figure 3). More specifically, there was a significant increase from baseline to 12-month follow-up in data gathering ($\chi^2 = 40$, $p < 0.001$), diagnosis

Figure 2 Knowledge (written) and skills (practical) exam scores at baseline and end of programme for 19 trainees in 2006–2008 cohorts

Figure 3 Self-evaluation of clinical skills pre-, mid-, and post-programme and at 6- and 12-month follow-up for 19 trainees in 2006–2008 cohorts

($\chi^2 = 42$, $p < 0.001$), and treatment and management ($\chi^2 = 37$, $p < 0.001$) in the adult population, as well as in collaboration ($\chi^2 = 20$, $p < 0.001$), self-reflection ($\chi^2 = 18$, $p < 0.01$), and self-assessment ($\chi^2 = 40$, $p < 0.01$) skills. Changes were not statistically significant for technical skills in the adult population or for any of the skills in the paediatric population.

Level 3 Evaluation

Change in clinical practice was examined via quantitative analysis of responses from the self-report of frequency of tasks in clinical practice gathered in surveys issued at baseline, mid-programme, end of programme, and 6 and 12 months post-programme. The increase in frequency of performance of clinical tasks and assumption of responsibilities related to extended practice roles that occurred by programme completion was maintained 12 months after graduation. These tasks and responsibilities included advanced adult history taking and physical examination, interpretation of laboratory

Figure 4 Self-reported frequency of performance of clinical tasks at baseline, mid-programme, end of programme, and 6 and 12 months post-programme for 19 trainees in 2006–2008 cohorts

and diagnostic imaging results, involvement in initiating treatment, follow-up and monitoring of treatment (including medication and complications), and patient education relating to these advanced tasks (see Figure 4).

Qualitative data obtained from comments on the practice-focused surveys were subjected to a thematic analysis. The five areas of change commonly experienced at 12 months after graduation by extended-role practitioners working in academic, non-academic, and remote community health care facilities included increased clinical responsibilities (red flags, investigations, interpretation); improved efficiencies in practice settings through process redesign; new or added roles as educational leaders and mentors to both patients and colleagues in the field of arthritis care; enhanced inter-professional collaboration and shared responsibility for patient-centred care; and facilitating improved access to care for patients with arthritis (through process redesign or through spearheading additional independently run clinics for triage purposes).

DISCUSSION

The ACPAC Program is a competency-based and intensively evaluated academic and clinical training programme for physical and occupational therapists experienced in arthritis management. It is the first formal university-based, post-licensure, inter-professional education programme to develop extended-role practitioners in arthritis care in Canada.²⁸ The ACPAC Program is also unique in its episodic delivery of curriculum, which consists of 10 intensive units offered 1 week per month over a 10-month period. The dual benefit of this adult-learner-based education programme is that active and valuable practitioners continue to engage in their clinical practice throughout the training period without

incurring any significant human health resource shortage at their home institutions and can most readily transfer new knowledge into practice as they learn and work. Furthermore, evidence from the literature on continuing education for health professionals suggests that active learning opportunities, learning delivered in a longitudinal or sequenced manner, and the provision of enabling methods to facilitate implementation in the practice setting appear to have a positive effect.²⁹

The ACPAC Program has been developed and is congruent with the findings and recommendations of the Arthritis Community Research and Evaluation Unit (ACREU), which have repeatedly identified a clearly defined need to develop a new model of primary health care for delivery of arthritis care.^{4,5} Furthermore, the ACPAC Program is a unique educational model that has created practitioners with extended roles in the arthritis care field without changes to legislation (as allowed by regulatory bodies in Ontario, some components of extended practice are broadly achieved by medical directives). The ACPAC Program as an entity could represent a viable template for the development of other inter-professional health education initiatives in the management of chronic diseases (e.g., cardiovascular, neurological).

The ACPAC Program's effort to evaluate its trainees extensively makes a unique contribution to the field and is an integral first step toward measuring the competency of this new health care practitioner in Ontario. The results of this study offer early quantitative and qualitative evidence of advanced skill and knowledge sets for arthritis care that are acquired by the end of the ACPAC training programme and are maintained at 12 months following graduation. The ACPAC-trained practitioner not only is competent, based on evaluation of the advanced skills and knowledge learned across the programme, but also appears well positioned to provide inter-professional shared responsibility for care in the management of patients with arthritis across diverse clinical settings. Growth in self-assessed advanced clinical knowledge and skills required for extended practice roles in arthritis care in the adult population demonstrated clear trends of improvement over the course of the programme and sustained improvement at follow-up for 6 of the 11 areas assessed. The five areas that showed less change over time and less sustained change in fact showed a lower level at baseline, and these areas (technical skills such as joint injections and joint aspirations, and all skills in the paediatric population) received less focus during the programme and were more difficult for trainees to implement during their clinical practice. Participation in performing advanced tasks and responsibilities in arthritis care rose by end of programme but dropped in the first 6 months following the end of the programme, since opportunities made available through

clinical encounters during the instructional weeks of the programme were reduced in practice, possibly as a result of delays in getting medical directives in place and other administrative issues related to implementing new practices in the trainees' clinical environments. However, increases in participation were generally regained and sustained by 12 months after graduation.

The distillation of responses from ACPAC-trained practitioners at 12 months after graduation provides insight into early clinical practice changes associated with their extended practice roles in rheumatology or arthritis care. Characterization of practitioners' responses at 12-month follow-up identified common emerging themes relating to practitioners' developing and advancing institution-based models of arthritis care that are expected to continue to evolve as these practitioners integrate further into their extended roles. Changes in models of arthritis care at 12 months after programme graduation appear directly associated with the extended-practice practitioner's ability to assume a triage role, which reflects the ability to make advanced clinical decisions about the care and management of the patient with arthritis at first point of contact. There is preliminary evidence that the extended practice role assumed by the ACPAC-trained practitioner has an effect on access to arthritis care through process redesign at sites where there is support for enhanced clinical opportunities and extended responsibilities. We suggest that these changes in clinical practice roles are essential if new models of arthritis care are to develop in academic, non-academic, and remote community health care settings across Ontario. It remains unknown whether delivery of health care to patients with arthritis has improved across all settings, as this can be determined only through system-level evaluation (Dixon's level 4).²⁴ Graduates of the ACPAC training programme are poised as key players to continue to improve models of arthritis care, particularly at sites where they are partnered with appropriate health care personnel to facilitate best practice for patients presenting with arthritis conditions.

Finally, the opportunity to engage in clinical and academic CEPD at the post-licensure level has the potential to support and retain physical and occupational therapists who are well positioned to participate as integral players in the model of primary health care in arthritis management.

It is now critical to evaluate the extent to which ACPAC Program graduates have developed and integrated new models of arthritis care throughout the province of Ontario, in order to provide ACPAC faculty, graduates, health care organizations, policy makers, and other stakeholders with important feedback about internal processes and external outcomes at the patient, organization, and system levels. Our current research efforts are aimed at determining the effect of these participants' clinical practice changes at a system level (level 4).²⁴ Evaluating

changes in inter-professional dynamics and the effectiveness of shared responsibility in the context of new models of arthritis care is of particular interest. These outcomes are important in evaluating and determining the impact of ACPAC Program graduates on various levels of the Ontario health care system and will help to ensure the vitality and sustainability of this new human health resource for arthritis care at the provincial and, ultimately, the national level.

LIMITATIONS

The scope of evaluation in assessing outcome in this health education programme was limited to the perceptions, competency, and self-reported change in clinical practice of the trainees/graduates of the ACPAC Program. It was beyond the scope of this study to evaluate further health education outcomes at the systemic level. Further studies are essential to describe and measure over time the health care outcomes related to the introduction of the extended-role practitioner in arthritis care into the health care system.

Lessons for Practice

- The ACPAC (Advanced Clinician Practitioner in Arthritis Care) Program was developed to prepare experienced physical and occupational therapists for extended practice roles, with the aim of delivering optimal, timely, and appropriate health care to patients with arthritis. The development of and the training and evaluation methods used in this competency-driven inter-professional academic and clinical post-licensure training programme followed a critical process incorporating appropriate and steady leadership as well as relevant clinical facilities and faculty with expertise in arthritis care.
- In order to consider issues of programme success, sustainability, and growth, it is essential to evaluate this unique post-licensure health care education programme by presenting outcome data that reflect learner reactions, competency, and change in clinical practice indicators (quantitative and qualitative).
- Change in practice of these ACPAC-trained practitioners appears to be related to their enhanced ability to triage (inflammatory vs. non-inflammatory arthritis) in their extended roles at 12 months following graduation.
- Inter-professional collaboration or shared responsibility for care opportunities appears to be an essential component of the success of the ACPAC-trained practitioner in developing new models of arthritis care.
- An ongoing effort is required to determine the extent to which participants' clinical practices change as they integrate into their extended practice roles over

time, the impact of the extended-role practitioner on development of new models of care, and changes in inter-professional relationships.

- The ACPAC training programme may provide a template for post-licensure training opportunities where there is a shortage of traditional medical specialists to manage other chronic diseases (e.g., in neurology and cardiovascular care) and the potential to utilize other human health resources exists.
- Graduates of the ACPAC training programme are poised as key players to continue to improve models of arthritis care, particularly at sites where they are partnered with appropriate health care personnel to facilitate best practice for patients presenting with arthritis conditions.

KEY MESSAGES

What Is Already Known on This Topic

In the past two decades, successful new models of arthritis care have been developed by incorporating extended-practice physical and occupational therapy practitioners in the delivery of both general musculoskeletal^{9–14} and arthritis care.^{2,15–17} These initiatives have resulted in better patient education,¹⁷ improved patient management and efficiency,^{10,18–21} and high levels of patient satisfaction.^{16,22} While the concept of extended-role clinicians and the site-specific benefit associated with their presence is documented internationally, there is a dearth of formal, competency-based, standardized training programmes with an evaluative component used to train these practitioners. In the absence of a standardized, competency-based programme, no outcome data are available to describe either the trainee or the programme, which further limits evaluation of practitioner roles, particularly in relation to their training experience.

What This Study Adds

The Advanced Clinician Practitioner in Arthritis Care (ACPAC) Program is the first formal, university-based post-licensure academic and clinical education programme in Canada to train and evaluate physical and occupational therapists within an extended practice role with the aim of delivering optimal, timely, and appropriate health care to patients with arthritis. The development of the curriculum and evaluation methods used in this competency-driven academic and clinical post-licensure training programme followed a critical process incorporating appropriate and steady inter-professional leadership and benefited from outstanding academic facilities and associated faculty with expertise in multiple aspects of arthritis care. This study presents essential first-step outcome data that reflect learner reactions, competency, and initial change in clinical practice indicators (quantitative and qualitative) of ACPAC-trained extended-role practitioner in arthritis care in Canada.

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