Canadian Geriatrics Society

EVALUATION OF PRE-CLERKSHIP GERIATRIC UNDERGRADUATE CURRICULUM AT THE UNIVERSITY OF OTTAWA AND BEYOND

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Abstract

Background: With the rapidly growing elderly population in North America (e.g., doubling of seniors and quadrupling of seniors ≥85 years old), there is a critical need for a strong geriatric foundation in undergraduate medical education. Currently, the Canadian Geriatrics Society's (CGS) "core competencies in the care of older persons" is a framework that guides the development of geriatric curricula in Canadian medical schools. Our objectives were (1) to compare the University of Ottawa's geriatric curriculum to the CGS core competencies, (2) to compare Ottawa's geriatric curriculum with the curricula of the other Canadian medical schools and (3) to determine the extent to which Canadian medical school geriatric curricula are in accordance with the CGS core competencies.

Methods: All 17 medical schools across Canada were contacted and asked to provide a list of geriatric content delivered to their students in pre-clerkship. Additional topics received from the schools that were not part of the CGS core competencies were also collected.

Results: Out of 17 schools, one school had no dedicated geriatric curriculum and two schools incorporated all of the CGS core competencies into their pre-clerkship curriculum. Four others were undergoing a similar evaluation of their geriatric content. The core competencies that were most consistently met were in the categories of cognitive impairment and functional assessment. The competencies least consistently met were related to adverse events and patient safety. Overall, 68.5% of the CGS competencies were met by all schools. Twenty-seven topics were identified that had been classified as geriatric curriculum by Canadian medical schools but are not part of the CGS core competencies.

Conclusion: This study provides information on the pre-clerkship geriatric curricula of the 17 Canadian medical schools in relation to the CGS core competencies. The challenges encountered during our study suggest heterogeneity in the quality of geriatric education in medical schools that should be explored in light of the changing Canadian demographics.

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Background

The geriatric population is increasing rapidly in developed countries worldwide. By 2026, seniors are expected to account for more than one fifth of the Canadian population and could exceed one quarter by 2056[1]. Health care reform surrounding elderly populations is an ongoing public health concern, especially with continuing evidence that current systems deliver poor quality care to patients with multiple co-morbidities linked with an aging population[2]. Although seniors currently represent just 14% of the population, they use 40% of hospital services in Canada and account for about 45% of all provincial and territorial government health spending[3]. In the upcoming years, the average family physician can expect the majority of their practice to be dedicated to the care of seniors, with estimates that 30% of their outpatients, 60% of their inpatients and 95% of their continuing care patients will be aged 65 and older[4]. In Canada, a proposed National Senior Strategy (see www.nationalseniorsstrategy.ca/wp-content/uploads/2015/01/National-Seniors-Strategy-Second-Edition.pdf) has made 169 recommendations including the need for every senior patient to have access to a health care provider and community supports, and for health care to be delivered in a coordinated way[5]. Delivery of such a vision requires adequate training of health care providers at the medical school level. As such, it is imperative that the geriatric content presented to undergraduate medical students is sufficient to train future physicians in the effective care of elderly patients. The critical importance of geriatric medical education should be reflected in medical school curricula.

Geriatric education finds its roots in 1979, when Dans and Kerr published a noteworthy article in *The New England Journal of Medicine*, advocating for the introduction of geriatrics into medical education[6]. This was one of the first publications indicating a lack of appropriate teaching in this field. In the decades to follow, there has been further inquiry into the development of specific geriatric curricula at both the medical school and residency levels. Most of this research has been conducted in the United States and Europe, with limited literature available on Canadian medical training[7-13]. Globally, despite consensus that specialized care for seniors leads to better health outcomes, there are concerns regarding the adequacy of geriatric training in medical schools and residency programs; these concerns are also supported by physician trainee self-reports[14].

Development of a national geriatric curriculum has been identified as a key component in effective teaching of the specialty[15]. In 2005, the CGS published a set of core competencies, updated in 2012, which can be used to guide the development of curriculum for the care of the elderly in medical schools. In total, there are 20 competencies divided into nine domains: cognitive impairment, functional assessment, falls, balance and gait disorders, medication management, biology of aging and atypical presentation of disease, adverse events, urinary incontinence, transitions of care and health care planning (see Table 3)[16]. The competencies outline the specific knowledge and skills a medical student should obtain pertaining to the care of older patients. To illustrate, the University of Ottawa's pre-clerkship geriatric curriculum, which was revised in 2010, was designed with the CGS core competencies as its fundamental basis. This two-week long curriculum, during an integrative learning block, covers various objectives derived from each competency in lecture, case-based learning and professional skill development sessions. In addition, optional geriatrics-related workshops and electives are offered throughout pre-clerkship to increase students' exposure to geriatrics.

To our knowledge, the most recent evaluation of Canadian geriatric curricula was a survey conducted by Gordon in 2011, which evaluated the hours dedicated to geriatrics material[17]. The survey, which had been previously conducted in 2004-2005, concluded that there had been "a small increase in total curriculum hours" in the 2008-2009 academic year curricula gathered from all 17 Canadian medical schools and residency programs. The authors found that geriatrics content of the undergraduate curricula ranged from 10 to 299 hours, with a mean of 82 hours. The survey also acknowledged the significant variability in geriatric medicine teaching between Canadian medical schools, highlighting that there is limited information to answer the question about whether practising Canadian physicians will have the skills necessary to deliver optimal care to seniors[17].

Objectives

The present study goal was to appraise the University of Ottawa pre-clerkship undergraduate medical education program, with the intention of informing future curriculum optimization. Specifically, our objectives were:

1. To compare the University of Ottawa's pre-clerkship geriatric curriculum with the CGS core competencies.
2. To compare the University of Ottawa's geriatric pre-clerkship curriculum with the curricula of the other Canadian medical schools.
3. To determine the extent to which Canadian medical school geriatric curricula are in accordance with the CGS core competencies.

Methodology

All 17 medical schools across Canada were contacted using a standardized email and were asked to provide a list of geriatric content delivered to their students. Specifically, geriatric curriculum directors, geriatric program directors, education representatives and geriatric interest group associates were contacted and asked to provide their schools' geriatric curriculum in any format available. Geriatrics content was defined as "the lectures, tutorials and laboratory or clinical skills sessions that were developed by internist geriatricians, geriatric psychiatrists or family physicians with additional Care of the Elderly training[17]." To ensure that the geriatric content represented content presented to all medical students, clinical time and electives were excluded. Schools were first contacted in October 2016, with multiple follow-up emails until the data requested was received. Data collection took place from October 2016 to July 2017.

The information received from the schools was independently reviewed by two authors of this study. Each author compared the information received with the CGS core competencies with the intent to determine if the schools taught each of the 20 CGS core competencies in pre-clerkship. The inclusion criteria for determining if a core competency was fulfilled were:

(a) The core competency was the primary focus of a curriculum lecture.
(b) The core competency was the primary focus of a curriculum case.
(c) The core competency was the primary focus of a curriculum objective.

In the event that the two researchers disagreed regarding whether a core competency was fulfilled by a school, the two researchers met to discuss the discrepancy and collectively reached a consensus.

The collected data were analyzed using simple descriptive statistics using Microsoft Excel. Each school was assigned a random number for data collection and analysis purposes. Additional topics received from the schools that were not part of the CGS core competencies were collected and tallied.

Results

The information received from the schools is described in Table 1. In addition to objectives, lectures and cases, alternative methods for presenting geriatric content were categorized under "other" including self-assigned learning objectives, simulation sessions, laboratories, online modules, skills sessions and tutorials.

Table 2 shows the breakdown per school of the number and percentage of CGS core competencies met by each school. Pearson's correlation between the number of competencies met (Table 2) and the amount of information received (Table 1) was 0.368 and can be seen in Figure 1. This suggests that there is no significant correlation between the amount of curriculum information received from a school and the number of CGS core competencies met by the school. Two medical schools incorporated all of the CGS core competencies into their pre-clerkship curriculum. One school had no dedicated curriculum that matched this study's definition of geriatrics curriculum in pre-clerkship. Four schools were undergoing a similar evaluation

of their geriatric content or curriculum. The overall average of CGS competencies met was 68.5% (SD ± 27.7). The University of Ottawa met 80% of the CGS core competencies.

The breakdown for the number and percentage of schools that met a specific CGS core competency can be found in Table 3. Broadly, the core competency categories that were most consistently addressed were in the categories of *cognitive impairment* and *functional assessment* with 75.1% and 73.6% representation respectively. The core competency that was the least consistently met in school curriculum was: "*Describe the indications, risks, alternatives and contraindications of physical and chemical restraints,"* which only six out of the 17 schools included in their curriculum. The competency category that was the least consistently met was *adverse events/patient safety* with only 44.1% of schools meeting these competencies.

Table 4 shows the prevalence of geriatric curriculum topics that were provided by each school but not part of the CGS core competencies. The most common topics were elder abuse and frailty. In total, there were 27 topics identified that had been classified as geriatric curriculum by the Canadian medical schools but are not explicitly part of the CGS core competencies.

Discussion

This study showed that there is wide variation in the amount and focus of geriatric education across Canadian medical schools in students' pre-clerkship years. The authors of this paper acknowledge that there are limitations in the scope of the study that prevented the collection of data that reflects geriatric curriculum throughout the entire medical school experience. For example, medical schools that do not have dedicated pre-clerkship geriatric exposure may have dedicated geriatric clerkship rotations where the CGS core competencies are met. By only collecting pre-clerkship geriatric curriculum, valuable elective, clinical and teaching experiences have been missed. In addition, the definition of geriatric curriculum as "…curriculum content created by geriatricians, Care of the Elderly physicians and geriatric psychiatrists[17]" excludes geriatric-related curriculum developed and delivered by specialists in other fields.

Nonetheless, the results of this study demonstrated possible topics (Table 4), apart from the current CGS core competencies that can be considered for inclusion in a geriatric curriculum. As themes such as frailty, elder abuse and comprehensive geriatric assessment become more prevalent in medical education, these results may also inform future iterations of the CGS core competencies for medical students.

Given the rapidly growing senior population and the importance of this area of education from both the ethical and economical perspectives of guiding health care, it is imperative that future physicians learn how to care for older patients with multiple co-morbidities. During our data collection period, it was noted that the University of Ottawa was not the only medical school revising their geriatric curriculum. Future considerations for schools that are undergoing this process may be to look into ways of evaluating the quality of geriatric education in Canada, instead of quantifying geriatric curriculum. Another direction of inquiry may be to reconcile the large heterogeneity in methods of geriatric teaching in the various medical schools as seen in Table 1. Research in this area can be derived from ongoing European attempts at improving geriatric curricula. In recognizing the extensive variability in the structure and content of geriatric medical training across Europe despite having undergraduate competencies set by The Union of European Medical Societies (see "European undergraduate curriculum in geriatric medicine developed using an international modified Delphi technique") geriatricians have developed an auditing tool, which will be used for comparing geriatric medicine training programs between countries[10, 11]. While heterogeneity in curricula may provide advantages, it will become important to develop tools to highlight effective ways of teaching geriatrics to inform future geriatric curriculum development.

The authors are also pleased to report that the results of this study have led to curriculum revision at the University of Ottawa. After identifying areas of geriatric education that were not fully explored in the two-week pre-clerkship geriatrics block, positive changes are currently taking place with objective modifications and additions to better address the missing competencies and fill the identified educational gaps.

Conclusion

In the process of collecting data to help appraise geriatric curriculum at the University of Ottawa's Faculty of Medicine, this study provides information on the pre-clerkship geriatric curricula of the 17 Canadian medical schools in relation to the CGS core competencies. Currently, there is significant heterogeneity between schools in their objective emphasis and education methods. There are opportunities, however, for schools to harmonize approaches in teaching key topics and to share resources with the goal of developing a comprehensive national curriculum that will standardize competencies and improve clinical outcomes in geriatrics and care of the elderly.

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Table 1. Summary of geriatric curriculum information received by type, in descending order of total curriculum

Canadian Schools	Number of Objectives	Number of Lecture Topics	Number of Cases	Number of "Other" Information
School 12	134	135	1	1
School 10	129	29	0	0
School 11	121	5	0	0
School 8	100	22	0	2
School 2	102	14	0	0
University of Ottawa	75	24	1	1
School 14	78	4	7	6
School 5	81	12	2	0
School 15	58	15	1	1
School 7	9	9	9	17
School 1	37	0	0	1
School 6	28	6	2	0
School 13	10	4	19	2
School 3	29	5	0	0
School 4	19	6	0	25
School 9	15	5	0	0
School 16	0	0	0	0

Table 2. The CGS core competencies met by Canadian schools

Canadian Schools	Number of CGS Core Competencies Met	Percentage of CGS Core Competencies Met (%)
School 2	20	100
School 6	20	100
School 14	19	95
School 8	19	95
School 15	18	90
School 10	17	85
School 11	16	80
University of Ottawa	16	80
School 3	15	75
School 13	14	70
School 1	13	65
School 12	13	65
School 5	9	45
School 7	9	45
School 9	9	45
School 4	6	30
School 16	0	0

Table 3. The CGS core competencies by number of Canadian schools that met the competencies in their curriculum

CGS Core Competencies	Number of Canadian Schools that Meet Core Competency	Percentage of Canadian Schools that Meet Core Competency (%)
Cognitive Impairment		
Perform a cognitive assessment and obtain collateral history relevant to cognitive and/or functional decline	14	82.6
Define and distinguish between the clinical presentations of delirium, dementia and depression	15	88.2
Diagnose delirium, formulate a differential diagnosis for potential causes and develop initial plans for evaluation and management	10	58.8
Diagnose dementia, formulate a differential diagnosis for potential causes and develop initial plans for evaluation and management	12	70.6
Average	12.8 (SD ± 2.2)	75.1 (SD ± 13.1)
Functional Assessment		
Evaluate baseline (premorbid) and current functional abilities (both basic and instrumental activities of daily living) using reliable sources of information	13	76.5
Develop initial plans for the assessment and management of patients with functional deficits, including the use of adaptive interventions, in collaboration with interdisciplinary team members	12	70.6
Average	12.5 (SD ± 0.7)	73.6 (SD ± 4.2)
Falls, Balance and Gait Disorder		
Construct a differential diagnosis (including risk factors) and initial plans for the evaluation and management of falls	12	70.6
Perform a preliminary gait and balance assessment using accepted standardized assessment tools	11	64.7
Average	11.5 (SD ± 0.7)	67.7 (SD ± 4.2)
Medication Management		
Obtain a detailed medication history that includes a list of all	9	52.9

medications being taken, dosages, frequencies, indications, evidence of benefit, side effects and an assessment of adherence		
Outline the pharmacokinetic changes that commonly occur with aging, and demonstrate the ability to modify drug regimens to account for age-related decreases in renal function	14	82.4
Identify medications that are most likely to cause adverse events in an older individual	11	64.7
Average	11.3 (SD ± 2.5)	66.7 (SD ± 14.8)
Biology of Aging and Atypical Presentation of Disease		
Describe the usual anatomical and physiological changes seen with aging	13	76.5
Demonstrate the ability to recognize and evaluate atypical presentations of common medical conditions (e.g., acute coronary syndrome, infections, acute abdomen, depression) that can be encountered in an older individual	11	64.7
Average	12 (SD ± 1.4)	70.6 (SD ± 8.3)
Adverse Events		
Identify and participate in efforts to reduce the potential hazards of hospital/institutional care (e.g., delirium, falls, immobility, pressure ulcers, incontinence, indwelling catheters, medication-related adverse events, malnutrition)	9	52.9
Describe the indications, risks, alternatives and contraindications of physical and chemical restraints	6	35.3
Average	7.5 (SD ± 2.1)	44.1 (SD ± 12.4)
Urinary Incontinence		
List the causes and outline initial plans for evaluation and management of transient (acute) and established (chronic) urinary incontinence	11	64.7
Transition of Care		
Communicate the key components of an appropriate transfer or discharge plan (e.g., accurate	12	70.6

medication list, need for support services, plans for follow-up)		
Identify and describe the signs and causes of caregiver stress	9	52.9
Describe the spectrum of community-based care resources and institutional care options available for seniors within their province of training	14	82.4
Average	11.7 (SD ± 2.5)	68.6 (SD ± 14.8)
Health Care Planning		
Define and describe (including the roles of physicians and substitute decision-makers) advance planning directives dealing with personal and financial decision-making, as permitted by legislation in their province of training	15	88.2

Table 4. Curriculum topics independent of the CGS core competency objectives

Geriatric Topic	Number of Schools Covering Topic	Percentage of Schools Covering Topic
Elder abuse	8	47.0%
Frailty	7	41.1%
Palliative care	6	35.3%
Comprehensive geriatric assessment	6	35.3%
Demographics	6	35.3%
Autonomy and quality of life	4	23.5%
Driving and licence	3	17.6%
Stigma and Ageism	3	17.6%
Nutrition	3	17.6%
Models of care	3	17.6%
Sexual health	2	11.8%
Successful aging and prevention	2	11.8%
Dizziness and balance	1	5.9%
Pain	1	5.9%
Dermatology	1	5.9%
Psychology of aging	1	5.9%
Wound care	1	5.9%
Osteoporosis	1	5.9%
Bed rest	1	5.9%
Headache	1	5.9%
History of geriatrics	1	5.9%
Isolation	1	5.9%
Alcohol	1	5.9%
Reflection of elderly interactions	1	5.9%
Advance directives	1	5.9%
Age-related vision and hearing changes	1	5.9%
Exercise	1	5.9%

Figure 1. Relationship between the amount of curriculum content received by school and the number of CGS core competencies met by school