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CONCEPT PAPER

Geriatric Emergency Medicine Fellowships: Current State of Specialized Training for Emergency Physicians in Optimizing Care for Older Adults

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ABSTRACT

Improving emergency department (ED) care for older adults is a critical issue in emergency medicine. Institutions throughout the United States and Canada have recognized the growing need for a workforce of emergency physician (EP) leaders focused on clinical innovation, education, and research and have developed specialized fellowship training in geriatric emergency medicine (GEM). We describe here the overview, structure, and curricula of these fellowships as well as successes and challenges they have encountered. Seven GEM fellowships are active in the United States and Canada, with five offering postresidency training only, one offering fellowship training during residency only, and one offering both. The backbone of the curriculum for all fellowships is the achievement of core competencies in various aspects of GEM, and each includes clinical rotations, teaching, and

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a research project. Evaluation strategies and feedback have allowed for significant curricular changes as well as customization of the fellowship experience for individual fellows. Key successes include an improved collaborative relationship with geriatrics faculty that has led to additional initiatives and projects and former fellows already becoming regional and national leaders in GEM. The most critical challenges have been ensuring adequate funding and recruiting new fellows each year who are interested in this clinical area. We believe that interest in GEM fellowships will grow and that opportunities exist to combine GEM fellowship training with a focus in research, administration, or health policy to create unique new types of highly impactful specialized training. Future research may include exploring former fellows' postfellowship experiences, careers, accomplishments, and contributions to GEM to better understand the impact of GEM fellowships.

Improving emergency department (ED) care for older adults is a critical issue in emergency medicine. The population of older adults is growing rapidly, due to increased life expectancy and the aging of the "baby boomer" generation, with U.S. adults aged ≥ 65 projected to double to 83 million by 2050.[1] The population of oldest old (aged ≥ 85) is increasing even more dramatically and will triple in the same period.[1] Additionally, older adults are increasingly seeking care in EDs rather than other settings.[2–4] As a result, it is projected that older adults may represent as much as 33% of ED patients by 2030.[5]

Older adult patients, who often have multiple chronic issues, atypical presentations of disease, and cognitive impairment, are fundamentally different than younger adults. Caring for older adults requires more ED resources, including more laboratory/imaging tests and social services.[2,6,7] Older adults have longer ED stay lengths, are more likely to be admitted, and are more frequently require intensive care unit admission.[2,6,7] They are also more likely than younger adults to have adverse outcomes after ED discharge.[2,8,9] High-quality ED care has the potential to make a dramatic impact on an older adult's health,[10,11] both in managing their acute complaint and in potentially identifying and intervening to address functional decline.

Most EDs were designed to manage acute injuries and illnesses and, especially in the context of increasing operational demands for rapid assessment, throughput, and early disposition, they are not set up to optimally care for older adults, who are typically complex patients with chronic disease.[5,12] Emergency physicians (EPs) report inadequate training in management of older adults and more difficulty caring for them.[13–15] Additionally, ED assessment and management of many common geriatric syndromes, such as delirium, falls, polypharmacy, and elder abuse, remain underresearched.[2,16,17]

The importance of improving ED care for older adults has been long recognized,[18–20] but it has begun to receive increased focus. EP researchers have been funded by the National Institutes of Health, the Society for Academic Emergency Medicine (SAEM) Foundation, the American College of Emergency Physicians' (ACEP) Emergency Medicine Foundation, and other public and private funders to explore high-priority geriatric emergency medicine (GEM) questions.[21] An expert panel has developed geriatric competencies for EM residents to guide curriculum development.[13] Furthermore, SAEM's Academy of Geriatric Emergency Medicine, launched in 2009, and ACEP's Geriatric Emergency Medicine Section are growing in membership and programmatic activities.

The Geriatric Emergency Department Guidelines were developed and published in 2014, through a collaboration between SAEM, ACEP, the American Geriatrics Society, and the Emergency Nurses Association to facilitate improvements in ED care to older adults.[2] These guidelines focus on staffing, education, enhanced policies and procedures, transitions of care, equipment, and performance improvement measures. Based on these guidelines, ACEP launched the Geriatric Emergency Department Accreditation (GEDA) program in 2018.[22] The GEDA program accredits EDs for geriatric expertise at different levels (Levels 1, 2, 3) based on an ED's initiatives to improve and measure quality of care for older adults. Additionally, the Geriatric ED Collaborative (GEDC) was created with funding from the John A. Hartford Foundation and the Gary and Mary West Foundation.[23] The GEDC assists hospital systems interested in making their community EDs more appropriate for care of older adults using the guidelines. GEDC works through collaboration with local leadership, on-site workshops, assistance with quality improvement projects, and information sharing. GEDC leaders have developed the Geriatric Emergency Care Applied Research (GEAR) Network, which is establishing research priorities, standardized data approaches, and measures for common geriatric emergency care syndromes. This network is also building a validated data

Table 1
Summary of Existing Geriatric Emergency Medicine Fellowships

Institution	Location	Year Program Initiated	Pre/Post Residency	Option for 2 Years With Master's Degree	SAEM Endorsed/ Approved	Fellowship Director	Fellowship Information
Beaumont Hospital	Royal Oak, Michigan	1998	Post	No	Applying	Lauren Cameron-Comasco	https://www.beaumont.edu/graduate-medical-education/fellowship-programs-non-accredited/emergency-medicine/geriatrics
Weill Cornell Medicine/New York Presbyterian Hospital	New York, New York	2005	Post	Yes	Yes	Michael Stern	https://emed.weill.cornell.edu/education/fellowship/geriatric-emergency-medicine-fellowship
University of North Carolina	Chapel Hill, North Carolina	2011	Post	No	Yes	Kevin Biese	https://www.med.unc.edu/emergmed/education/fellowships/geriatrics/
Schwartz/Reisman Emergency Medicine Institute/Mount Sinai Hospital	Toronto, Ontario	2016	Both	No	Yes	Don Melady	https://www.sremi.ca/geriatric-emergency-medicine-fellowship
University of California, Davis	Sacramento, California	2015	Post	Yes	No	Katren Tyler	https://health.ucdavis.edu/emergency/education/fellowship/geriatric.html
Massachusetts General Hospital	Boston, Massachusetts	2018	Post	Yes	Yes	Shan Liu	https://www.massgeneral.org/emergencymedicine/services/treatmentprograms.aspx?xml:id=2068&display=fellowship
Johns Hopkins University	Baltimore, Maryland	2018	Pre	N/A	N/A	Phillip Magidson	https://www.hopkinsmedicine.org/emergencymedicine/em-residency/_docs/fast-geriatrics-flyer.pdf

bank to support opportunities to conduct geriatric emergency care research and facilitating future multicenter studies. As a result of these efforts, GEM is growing as a subspecialty within emergency medicine.

Institutions throughout the United States and Canada have recognized the growing need for a workforce of EP leaders focused on clinical innovation, education, and research and have developed specialized fellowship training in GEM. We describe here the overview, structure, and curricula of these fellowships as well as challenges and successes they have encountered.

OVERVIEW OF CURRENTLY ACTIVE FELLOWSHIPS

At the time of this publication, there are seven GEM fellowships active in the United States and Canada. Details of these fellowships are shown in Table 1. The fellowship director from each of these programs has contributed to this manuscript (SWL, LCC, KB, PM, KT, DM, MES). The first fellowship was launched at Beaumont Hospital, in Royal Oak, Michigan, in 1998, although the earliest iteration of the curriculum differed from its current program as well as from more recently developed programs. Weill Cornell launched its program in 2005, the first of many with similar curricula. Five programs are exclusively postresidency fellowships. Johns Hopkins offers a 1-year minifellowship during the fourth year of a 4-year residency. Schwartz/Reisman Emergency Medicine Institute/Mount Sinai Hospital/University of Toronto offers both a fellowship during the fourth year of a 5-year Canadian residency and a postresidency fellowship. Three of the postresidency fellowships offer an option of a 2-year fellowship with increased focus on research including a fully funded master's degree. To date, a total of 25 fellows have completed these seven programs.

FELLOWSHIP DESIGN AND FUNDING

All of the postresidency clinical fellowships are designed with the fellow working part-time independently as an attending EP while participating in the fellowship. Fellows work clinically as an attending physician generally between 40% to 70% of full-time attending, with the remaining time devoted to fellowship activities. This approach completely or partially funds the fellowship using clinical revenue (many

GEM fellowships are designed to be budget neutral), allows for the fellow to earn a more competitive salary during training, and ensures that recent residency graduates continue the active development of their clinical practice. Some fellowships receive additional funding provided by the department, institution and/or by foundation support, and private philanthropy.

SAEM FELLOWSHIP ENDORSEMENT/APPROVAL

To date, existing GEM fellowships have not sought to become accredited by the American College of Graduate Medical Education (ACGME). Despite the potential value of accreditation, GEM fellowship directors have recognized that ACGME involvement would fix a fellow's salary based on postgraduate year and would preclude independent practice as an attending EP at the institution during fellowship training. This would dramatically change both the funding for the fellowship and its desirability to potential applicants. In addition, the non–ACGME-accredited status enables changes and improvements to fellowship programs to occur more expeditiously, as is fitting for a new specialty. To ensure a degree of standardization to fellowship training within fellowships not accredited by the ACGME, SAEM created an endorsement/approval process for fellowships in specialized areas, including GEM.

In 2014, as part of this endorsement/approval process, guidelines were developed for training programs that address milestones in curricular elements, faculty support recommendations, and career development opportunities. Two authors (KB, MES) served on the committee developing the process and requirements for GEM fellowships. Programs wishing to have SAEM endorsement/approval of their fellowship may complete an application, which is independently reviewed. Five GEM fellowships currently have SAEM endorsement/approval and another is currently applying.

GEM CURRICULUM

The backbone of the curriculum for all fellowships is the achievement of core competencies in various aspects of GEM. The core competencies used by Weill Cornell, which have also been adopted subsequently by other fellowships, are shown in Table 2. These are an adaptation for fellows of the GEM core competencies for EM residents published by Hogan et al. in 2010.[13] During the fellowship, to develop these competencies and become a leader in GEM, the fellow participates in clinical rotations, teaches, and conducts a research project.

Clinical Rotations

Each fellowship includes several clinical rotations, intended to increase the fellow's understanding of multidisciplinary primary and specialty care of older adults across the continuum of care and to expand and reinforce their understanding of GEM core competencies. Additionally, these rotations help the fellow identify gaps in care provision and opportunities for improvement. Rotations that are included in at least one fellowship are shown in Table 3.

The goal of inpatient rotations is for the GEM fellow to develop an understanding of the continuation of acute management after admission, the multidisciplinary team approach to patient care, safe discharge planning, application of functional assessment tools, and ethical and legal issues related to caring for older adults. Inpatient rotations typically include services devoted exclusively to care of older adults, including acute care of the elderly units. Geriatric clinic rotations demonstrate the outpatient management of acute and chronic illness, including ED-relevant strategies to maximize quality of life and function, minimize the impact of geriatric syndromes such as polypharmacy, ensure treatment approaches are consistent with a patient's goals, and collaborate effectively with families and caregivers. Due to the increasing number of independent older adults with chronic medical conditions, the need for home-based clinical care is steadily increasing. As a result, many fellowships include a rotation with home-based primary care/house calls. Specialty services and clinics with particular relevance for older adults, including palliative care, psychiatry, trauma/orthopedics, neurology, and physical medicine and rehabilitation, are also included. Many fellowships include exposure to long-term care and subacute rehabilitation facilities to improve the fellow's understanding of management of both chronic conditions and emergencies in older adults who are residents of these institutions. Particular focus is on appreciating circumstances surrounding the decision to transfer a resident to the ED and how they may be avoided or optimized. An important emphasis of all rotations is transitions of care for older adults and continuity between different health care settings. Notably, Schwartz/Reisman Emergency Medicine Institute/Mount Sinai Hospital/

Table 2
Geriatric Emergency Medicine Fellowship Core Competencies

1. Trauma/falls
a. Recognize patterns of injury in geriatric trauma.
b. Recognize difficulty in recognizing occult shock in geriatric trauma patients (older adults may present with absent or blunted signs and symptoms (e.g., absent pain, tachycardic response and neurologic changes). Understand the benefit to instituting appropriate early monitoring and testing.
c. Assess the effect of preexisting conditions on morbidity and mortality in geriatric trauma.
d. Evaluate for precipitating causes of falls (e.g., infection, physiologic changes of aging, medications, substance/alcohol use/abuse, gait instability, comorbidities).
e. Assess for gait instability in all community-dwelling older adult. Awareness of appropriate disposition/services and follow-up.
2. Delirium and dementia
a. Know the definitions of delirium and dementia. Assess current mental status including any subtle changes from baseline (using ED-friendly tools). Determine if delirium is superimposed on dementia.
b. Formulate an age-specific differential diagnosis for older adults with cognitive and behavioral impairment.
c. Initiate a diagnostic workup to determine the etiology and initiate appropriate treatment.
d. Recognize causative factors in agitated older adults (e.g., untreated pain, hypoglycemia, hypoxia, and use of irritating tethers—Foley catheter, IV, monitor leads, blood pressure cuff, pulse ox, environmental factors (e.g., noise, light, temperature), lack of family member, and sundowning).
3. Atypical presentation of disease
a. Know the physiologic changes (including each organ system) associated with aging that increase the risk of atypical presentations of disease.
b. Formulate a differential diagnosis for older adult patients with infectious processes, acute abdomens, and acute coronary syndromes in light of potential absent or blunted signs and symptoms (e.g., fever, cough, pain, leukocytosis).
c. Recognize the common geriatric syndromes (e.g., falls, dizziness, altered mental status, generalized weakness) and generate a differential diagnosis for older adult patients with these presentations.
4. Medication management and polypharmacy
a. Know the physiologic changes associated with aging that affect pharmacokinetics and pharmacodynamics (e.g., bioavailability, renal function, fat distribution, CNS sensitivity) and how they increase the risk of polypharmacy.
b. Be able to prescribe appropriate drugs and dosages for the older adult taking into account their current medications, acute and chronic diagnoses, and functional status.
c. Assess for adverse drug events as the etiology for presentations to the ED. Generate a list of high-risk drugs, used either alone, or in drug–drug or drug–disease interactions (e.g., benzodiazepines, digoxin, insulin, NSAIDs, opioids, and warfarin).
d. Explain all newly prescribed drugs to older adults and caregivers at discharge assuring they understand how and why the drug should be taken, the possible side effects, and how and when the drug should be stopped.
5. Transitions of care
a. Document history obtained from skilled nursing or extended care facilities of the acute events necessitating ED transfer, including goals of visit, medical history, medications, allergies, cognitive and functional status, advance care plan, and responsible PCP, and provide skilled nursing or extended care facilities and/or PCP with ED visit summary and plan of care, including follow-up when appropriate.
b. With recognition of unique vulnerabilities in older adults, assess and document suitability for discharge considering the ED diagnosis, including cognitive function, the ability in ambulatory patients to ambulate safely, availability of appropriate nutrition/social support, and the availability of access to appropriate follow-up therapies.
c. Select and document the rationale for the most appropriate available disposition (home, extended care facility, hospital) with the least risk of the many complications commonly occurring in older adults during inpatient hospitalizations.
d. With recognition of unique vulnerabilities in older adults, assess and document suitability for discharge considering the ED diagnosis, including cognitive function, the ability in ambulatory patients to ambulate safely, availability of appropriate nutrition/social support, and the availability of access to appropriate follow-up therapies.
6. Palliative care and pain management
a. Assess older adult patient's goals of care for those with a serious or life-threatening condition and manage accordingly.
b. Assess for pain and provide ED management mindful of specific considerations for pain management in the older adult.
c. Know how to manage older adult patients undergoing hospice care while in the ED and how to access hospice care if relevant.

NSAIDs = nonsteroidal anti-inflammatory drugs; PCP = primary care physician.

University of Toronto includes an ED-based rotation where the fellow only provides care for older adult patients.

The educational goals are similar for all GEM fellowships, and the decision to include specific rotations has been driven primarily by the potential for the clinical experience to enhance the fellow's nuanced understanding of GEM core competencies. Fellowships have chosen different rotations to include based on practical concerns including availability of a clinical service at the institution/health system, how active a service is and how frequently it interfaces with the ED/cares for ED patients, the willingness of a service to integrate a GEM fellow in a meaningful role, the educations culture of a service, and the presence of other trainees. Notably, geriatric specialty offerings differ widely in scope and size between institutions. As a result, rotation differences for GEM fellowship programs also reflect the heterogeneity of existing strategies for geriatric care delivery.

Each fellowship has a core of required rotations and an opportunity for the fellow to choose among

Table 3
Geriatric Emergency Medicine Fellowship Rotations

Inpatient
• Geriatrics service (acute care for the elderly unit) • Geriatrics consult service • Geriatric psychiatry consult service • Palliative care consult service • Geriatric trauma/fracture/orthopedics service • Intensive care units • Clinical pharmacology
Outpatient
• Geriatrics clinic • Home-based primary care/house calls • Geriatric psychiatry clinic • Hospice/palliative care clinic • Movement disorders/neurology clinic • Physical medicine and rehabilitation clinic • Urology clinic • Neuropsychology
Long-term care
• Nursing home/subacute rehabilitation center
ED
• Emergency care for geriatric patients

electives to allow an educational experience tailored to their goals and interests.

Fellow as Educator

A key component of the fellow's training is learning to be an educator of GEM concepts. Each fellowship requires the fellow to teach emergency medicine resident physicians and others. Typically, this includes developing and presenting lectures, designing/writing simulation cases, leading discussions on GEM best practices, and acing as a resource from providers from other disciplines including nursing and emergency medical services. Additionally, the fellow conducts bedside teaching while working clinically.

Research Project

Each fellowship is required to develop a significant scholarly project. The fellow is closely mentored by the fellowship director and others to define a project that is impactful and feasible. Previous successful GEM fellow projects have included development and assessment of a clinical delirium protocol, examination of injury patterns suggestive of physical elder abuse, investigation of the impact of use of various anticoagulants on intracranial hemorrhage risk in falls, assessment of alcohol misuse/abuse in older adults, a protocol to guide appropriate use of indwelling urinary catheters in geriatric ED patients, pain management in orthogeriatric syndromes, and strategies for identifying frailty. Fellows completing a 2-year fellowship and obtaining a master's degree are prepared to pursue academic research careers in GEM, with several applying for extramural grant funding during or shortly after the conclusion of the fellowship.

EVALUATION

As these programs were unique when initially designed, a robust evaluation process has been necessary to track progress toward milestones, ensure that fellows have a high-quality educational experience, and identify any opportunities for improvement. Current fellowships have various strategies of formal and informal evaluation, including regular one-on-one meetings with the director, formal written evaluations of program and rotations, performance reviews, participation in geriatrics fellow in-service examinations, and exit interviews. This evaluation and feedback have allowed for significant curricular changes at several institutions. For example, rotations on which opportunities for relevant experience was limited or the fellow was not able to play a meaningful role were replaced by others, and rotations offering unique, high-quality training were expanded. These evaluations have also facilitated customization of the fellowship experience for individual fellows based on their goals and interests. Notably, formal evaluation of the impact of the existence of GEM fellowship training on patient-related outcomes or ED metrics has not yet occurred.

SUCCESSES AND CHALLENGES

Existing fellowships have already had important successes, shown in Table 4. Key successes include an improved collaborative relationship with geriatrics faculty that led to additional initiatives and projects and former fellows already becoming regional and national leaders in GEM. Fellowships have identified several challenges in launching and maintaining these ambitious training programs. These challenges are shown in Table 4. The most critical challenges have been ensuring adequate funding and recruiting new fellows each year who are interested in this clinical area, although recent increased attention nation attention on GEM has led to increased numbers of applicants at some programs.

CONCLUSION AND NEXT STEPS

Geriatric emergency medicine fellowships play a critical role in improving care for older adults by developing

Table 4
Successes and Challenges for Geriatric Emergency Medicine Fellowships

Successes
• Fellows report that completing the fellowship has been advantageous when applying for jobs • Fellows have developed and evaluated innovative ED-based clinical protocols to improve geriatric care that have been sustained in their institution and adopted elsewhere • Fellows have incorporated dedicated geriatric emergency medicine education focusing on core topics to all levels of providers at their institutions, including medical students, emergency medicine attending and resident physicians, advanced practice providers, and nurses • Fellowship has served as a catalyst to strengthen collaborative relationship between emergency medicine and geriatrics faculties, leading to new initiatives and projects • Fellowship has enhanced institution's reputation as innovator in emergency medicine • Electives allowed for customization of fellowship experience and ability for fellow to pursue their interests in depth • Multiple former fellows have remained at institution, developing a division of geriatric emergency medicine and continuing to collaborate on development of clinical projects/protocols and research as well as improving the education of both existing and new faculty as well as EM residents and medical students who train at the hospital • Former fellows have already become regional and national leaders in geriatric emergency medicine • Former fellows have received funding from the National Institutes of Health and other public and private funders to conduct geriatric emergency medicine research • Former fellows have become directors of and have launched geriatric EDs • Former fellows have gone on to become fellowship directors
Challenges
• Difficulty recruiting fellows interested in geriatric emergency medicine • Struggles obtaining longitudinal funding to maintain fellowship • Lack of support from institutional leadership • Absence of academic geriatrics at institution

the next generation of regional, national, and international emergency physician leaders in clinical medicine, education, and research. In addition, former fellows may use their expertise to become local champions in the EDs in which they work, educating their peers and leading new initiatives and changes in clinical practice. The next steps include exploring former fellows' postfellowship experiences, careers, accomplishments, and contributions to geriatric emergency medicine to better understand the impact of geriatric emergency medicine fellowships. Additionally, future research should explore the impact of launching and maintaining a geriatric emergency medicine fellowship as well as having fellowship-trained faculty on staff and in leadership positions on patient-related outcomes and ED metrics is another critical future goal. These investigations may be incorporated into existing research programs such as the Geriatric Emergency Care Applied Research Network.

Interest in specialized geriatric emergency medicine training will likely grow as emergency physicians increasingly recognize the value of optimizing care for older adults, who will comprise more and more of their patients. Additionally, geriatric ED accreditation will likely be pursued by many EDs, driven by a desire to improve quality of care and to stay competitive with peer institutions. To receive accreditation, an ED must have a physician champion/medical director, and geriatric emergency medicine fellowship graduates are uniquely qualified to serve in this role. As a result of this increased interest, it is likely that new geriatric emergency medicine fellowship programs will be launched, with some already in planning stages. We hope that the structure, curricula, and experience of currently active programs described here will inform the design process. Further, we believe that opportunities exist to combine geriatric emergency medicine fellowship training with a focus in research, administration, or health policy to create unique new types of highly impactful specialized training. Ultimately, we hope that specialized fellowship training will continue to play an important role in the development of geriatric emergency medicine as a subspecialty and the improvement of quality of care delivered to older adult ED patients.

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