WHAT IS KNOWN ABOUT OUTCOMES AND IMPLEMENTATION OF GERIATRIC EMERGENCY MANAGEMENT (GEM)

A RAPID REVIEW SYNTHESIS

OCTOBER 15, 2025

Supporting Transformation through Research, Evidence, and Action in Mental Health (STREAM) Lab at the Waypoint Centre for Mental Health Care

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STREAM Lab

The Supporting Transformation through Research, Evidence, and Action in Mental Health (STREAM) Lab is dedicated to providing timely and comprehensive evidence reviews to support provincial partners in improving mental health and addictions care across Ontario. STREAM Lab products deliver actionable health system insights that can inform planning and decision-making processes.

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Key points

Why did we do this?

- Geriatric Emergency Management (GEM) is an emergency department (ED)-based model of care that includes specialized clinicians, processes, and/or environmental modifications to enhance care for older adults with complex health needs
- There is interest in exploring and disseminating evidence on GEM to support implementation across Ontario

What did we do?

- We conducted a structured search to identify empirical studies addressing outcomes and implementation of GEM

What did we find?

- We identified 13 studies of varying study designs, including 11 focused on outcomes of GEM, and two on implementation considerations
- GEM reduced hospital admissions and costs, while findings were mixed for hospital readmissions and ED re-visits
- Implementation of GEM may be influenced by strategies like clarifying processes and engaging champions, and by factors like resource availability and staff expertise
- The included literature did not capture information about health outcomes, care experiences, or equity-specific effects or adaptations

What does this mean for Ontario?

- Ontario decision-makers may consider:
    - Evaluation of GEM to better understand its effects within the Ontario context, including holistic effects such as quality of life
    - Further describing the integration of GEM with existing services, including health and social services
    - Developing, implementing, and evaluating cultural adaptations of GEM and cultural safety training for GEM staff to meet the needs of diverse patients and carers
    - Exploring adaptations (e.g., remote technologies) of GEM for rural and remote areas

Introduction

Patients aged 65 and older account for 20% to 40% of emergency department (ED) visits in Canada - a larger proportion than any other age group (Ellis et al., 2022). These patients often live with complexities such as frailty, multimorbidity and geriatric syndromes (Mooijaart et al., 2021). Moreover, according to CIHI (2017), the older adult population is expected to grow by 68% over the next twenty years. Therefore, immediate and sustained efforts are needed to implement models of care that address the wellbeing and specific care needs of Ontario's older adult population.

Geriatric Emergency Management (GEM) is a promising approach to serving geriatric patients presenting to the ED (Mooijaart et al., 2021). Provincial Geriatrics Leadership Ontario (PGLO) convenes a network of GEM programs across the province and disseminates resources to support implementation. According to North Simcoe Muskoka Specialized Geriatric Centre and partners (2023), GEM programs in Ontario:

1. Serve older adults ages 65 and older experiencing frailty, multimorbidity, or complex needs;
2. Are based within the ED;
3. Include a multidisciplinary geriatric team or clinician who has specialized gerontology knowledge and skills;
4. Follow geriatric care processes (e.g., geriatric competency training, established protocols); and
5. Include a senior-friendly ED environment (e.g., a designated unit, or modifications to the existing setting, resources, care processes, or programs)

This rapid evidence synthesis

PGLO is interested in synthesizing academic literature on GEM model implementation and outcomes. This report addresses the following questions:

- What is known about quintuple aim outcomes (i.e., health outcomes, patient and provider experiences, costs, and health equity implications), and health service utilization impacts of GEM? and
- What is known about implementation considerations and strategies for GEM?

Methods

A detailed description of our approach is included in **Appendix 1**. Briefly, we conducted structured searches in two academic databases (MedLine and PsycINFO) to capture articles focused on outcomes and/or implementation considerations of GEM. We defined GEM as specialized ED-based models of care for older adults with frailty, multimorbidity, or complex needs. We limited our search to empirical studies published within the last 10 years. After initial screening, we further limited our scope to exclude articles that focused on a single intervention, reported on the extent of implementation but not on implementation strategies, or had limited or no information on implementation considerations or outcomes. The final list of included studies along with the extracted data is in **Appendix 2 (sheet 1)**. Also available in **Appendix is 2**

(sheet 2) is a list of studies that met our initial inclusion criteria but were subsequently excluded as described above.

Findings

We included a total of 13 studies of varying study designs (e.g., cohort, case-controls, cross-sectional studies, non-randomized trial, qualitative studies). Eleven studies reported on outcomes, and two addressed implementation considerations. Most of the included studies were conducted in the United States.

GEM models and programs

Included studies focused on eight different GEM programs. **Table 1**, below, provides each program's name and jurisdiction, the number of included articles referencing it, and a brief description of the program. As noted in the introduction, PGLO describes GEM as comprising five elements: (1) a focus on older adults with complex needs; (2) a basis in the ED; (3) inclusion of specialized clinicians or teams; (4) use of defined care pathway protocols; and (5) senior-friendly environmental modifications. All included articles were required to describe a program that addressed the first two elements, while Table 1 clarifies whether the remaining three elements were explicitly addressed in each.

Table 1. *Overview of identified GEM programs.*

Program name and jurisdiction	Number of studies referencing this program	Program description	Includes a specialized geriatric clinician or team?	Includes a defined process for patient flow?	Includes environmental modifications?
GEDI (Geriatric Emergency Department Intervention) **USA**	4	A nurse-led program for older adultsages 70 and over that includes a team of advanced practice nurses (with a minimum of 5 years of geriatric experience), and operates as a subspecialty team supporting ED nurses and physicians (Marsden et al., 2020; Marsden et al., 2021; Marsden et al., 2022; Hwang et al., 2021).	✓	✓	✓
GEDI WISE TCN (Geriatric Emergency Department Innovations in care through Workforce, Informatics, and Structural Enhancements - Transitional Care Nurse) **USA**	2	A specialized nurse identifies older adults in the ED with geriatric-specific needs and coordinates their transition home (Dresden et al., 2020; Hwang et al., 2018).	✓	✓	✓
GEDA (Geriatric Emergency Department Accreditation) **USA**	1	Formally accredits geriatric EDs in the US according to standard guidelines and adherence to best practices, to obtain designations from the American College of Emergency Physicians (ACEP) as Level 1 (gold), Level 2 (silver), or Level 3 (bronze) (Chary et al., 2024).	✓	✓	✓

GEMS (Geriatric Emergency Management Specialist) **USA**	1	A pilot program that involves trained care providers conducting geriatric assessments and planning care for older adult patients in the ED (Cohen et al., 2024).	✓	✓	Not reported
GERI-VET (Geriatric Emergency Room Innovations for Veterans) **USA**	1	A program to identify at-risk older adult veterans, and provide them with geriatric care such as screenings, consultation with trained Intermediate Care Technicians (who were previously military medics and corpsmen), referrals to age-friendly resources, and support with ED transitions (Huded et al., 2022).	✓	✓	✓
GENIE (Geriatric Emergency Nurse Initiative Expert) **USA**	1	Provides comprehensive nursing evaluations and care management for older adult patients at an accredited geriatric ED (Haynesworth et al., 2023).	✓	✓	✓
GEMA Team (Geriatric Emergency Medicine Assessment Team) **USA**	1	Provides assessment and treatment by a multidisciplinary team consisting of a geriatric emergency medicine-trained provider, geriatric care manager, pharmacy technician and an occupational therapist if needed (Keene and Cameron-Comasco, 2022).	✓	✓	Not reported
GEMU (Geriatric Emergency Medicine Unit) **France**	1	The first GEMU in France, which involves a multi-disciplinary team of geriatricians, gerontology trained nurses, and social workers specialized in geriatric care, who provide specialized medical and social assessment (Bosetti et al., 2020).	✓	✓	Not reported

Health, experience, and cost outcomes

Health outcomes

None of the included studies reported directly on health outcomes.

Patient, provider, and caregiver experiences

None of the included studies reported directly on patient, provider, or caregiver experiences.

Costs

None of the included studies reported on cost-effectiveness. However, three studies examined the cost savings from GEM programs or interventions, and cost savings for patients in the intervention group compared to those who did not receive GEM. GEM patients had lower costs than comparators at the index visit (Haynesworth et al., 2023) and at follow-up periods ranging from 30 to 90 days (Haynesworth et al., 2023, Hwang et al., 2021). Cost savings were due to decreased ED and inpatient utilization (Haynesworth et al., 2023). GEM programs were also estimated to be cost-saving for hospitals on an annual basis, based on estimated averted inpatient care costs (Keene and Cameron-Comasco, 2022), including due to decreased length of inpatient stay (Hwang et al., 2021).

Health service utilization

ED utilization

Five studies examined **ED revisits**, with mixed results. Two of these studies reported increased risk of ED revisits, including within 72 hours (Hwang et al., 2018) as well as 30 days (Haynesworth et al., 2023), among GEM patients compared to controls; in both studies, the increase in risk of revisits was modest (under 5%). One study focused on older adult veterans and found no difference in ED revisits between the intervention and control group (Huded et al., 2022), while another study found no difference among residents of residential aged care facilities following GEM implementation (Marsden et al., 2020). Finally, a study compared hospitals that were early, late, and non-adopters of GEM, with data collected at baseline in 2006, and several years later following GEM implementation in 2013/14 (McCusker et al., 2017). This study found that early, late, and non-adopter hospitals had a similar increase in ED revisits that did not result in hospital admission. Over the same time period, there was no change in ED revisits that did result in hospital admission, regardless of adoption status.

Five studies reported on **ED length of stay** (LOS) for older adults in GEM programs, and found mixed results. Two studies found longer ED LOS for GEM patients compared to non-GEM patients, with one finding a 19 minute longer stay among patients receiving GEM assessment (Keene & Cameron-Comasco, 2022) while another reported a more substantial 170-minute difference (Cohen et al., 2024). One study found no significant difference in ED LOS among veterans receiving GEM and the control group (Huded et al., 2022). Similarly, the study cited above comparing early, late, and non-adopters of GEM found that hospitals in the early adopter group had the greatest ED LOS at baseline. There was no difference in change in ED LOS among the hospital groups over time (McCusker et al., 2017). A final study found reduced ED LOS for RACF residents following implementation of GEM at two hospitals (Marsden et al., 2020).

One study considered **admission to the ED for observation**. This study found that the GEMS program was associated with increased odds of ED observation admissions for GEM patients, compared to non-GEM patients (Cohen et al., 2024).

Hospital admission

Six studies examined **hospital admissions**, with results of lowered rates of hospital admissions in most studies. Five of these studies found GEM models significantly reduced hospital admissions for GEM patients compared to non-GEM patients at the index ED visit (Cohen et al., 2024; Haynesworth et al., 2023; Huded et al., 2022; Keene and Cameron-Comasco., 2022), and at 30 days (Huded et al., 2022; Hwang et al., 2018; Haynesworth et al., 2023), and 90 days (Haynesworth et al., 2023). Specific estimates of reductions in admissions varied across studies. For instance, in one study 50.1% of GEM patients and 57.5% of controls were admitted to hospital at the index visit (Huded et al., 2021); in another, admission rates at index ED visit was 34.1% for GEM patients and 56.4% for controls (Cohen et al., 2024). However, one study comparing early, late, and non-adopters of GEM reported similar reductions in admission rates among older adult patients across all hospitals, regardless of adoption status (McCusker et al., 2017).

Two studies reported on **hospital readmissions** for older patients in GEM programs, with mixed results. One study found significantly lowered risk of readmission for GEM patients with neurocognitive disorders compared to a control group that did not receive GEM, after controlling

statistically for differences between the groups (Bosetti et al., 2020). However, the other found that GEM reduced readmissions at some but not all study sites (Dresden et al., 2020).

Two studies reported on **hospital LOS** for older adults in GEM programs, and found mixed results. One study found no significant difference in hospital LOS for residential care residents following implementation of GEM (Marsden et al., 2020). The second study found that hospital LOS was 25 hours shorter for GEM-assessed patients compared to non-GEM patients (Keene and Cameron-Comasco, 2022).

Implementation considerations

Two studies focused on implementation of GEM (Chary et al., 2024; Marsden et al., 2021). One study reported on implementation experiences in relation to GEDA (Geriatric Emergency Department Accreditation) designation (Chary et al., 2024). The second study focused on the structures and processes to successfully deliver the GEDI model to geriatric patients (Marsden et al., 2021).

Across these two studies, factors affecting the implementation of GEM included…

- the presence of "champions" for the intervention (Marsden et al., 2021; Chary et al., 2024);
- funding and resources (e.g., geriatric-specific resources and equipment; physical infrastructure such as an office space; EHR tools; Chary et al., 2024l Marsden et al., 2021); and
- nurses' gerontology-specific expertise, experience, and communication skills (Marsden et al., 2021).

Strategies for implementation included…

- monitoring care processes (Chary et al., 2024);
- providing feedback to staff and leaders (Chary et al., 2024);
- using educational materials (Marsden et al., 2021) and offering ongoing staff education (Chary et al., 2024);
- securing external funding (e.g., grants and/or health system funding opportunities) for ED accreditation and upgrades (e.g. staffing, equipment) (Chary et al., 2024).

Equity considerations

There is limited literature directly addressing inequities in ED care for older adults in Canada. However, health inequities are clear among older adults. For example, racialized older adult immigrants are less likely than white and Canadian-born older adults to report good physical health (McAlpine et al., 2023). Similarly, Indigenous (First Nations, Inuit, and Métis) older adults report not receiving the same level of care as non-Indigenous older adults (Canadian Medical Association, 2016).

None of the included studies reported directly on equity-related concerns or equity-relevant intervention adaptations within GEM. Only one of the included studies highlighted equity implications, noting that geriatric EDs receiving accreditation status are often in urban and socioeconomically advantaged areas (Chary et al., 2024). The authors cautioned that the GEDA program might unintentionally worsen disparities in geriatric care and outcomes between different sites, especially in rural or remote regions lacking resources to achieve accreditation. Future research can describe GEM effects, implementation considerations, and/or adaptations

in relation to equity-denied older adult populations including older adults who are racialized or Indigenous; are immigrants, refugees, refugee claimants, or have precarious migration status; are Francophones, or members of other linguistic minority communities; experience poverty or homelessness; reside in rural or remote areas; are LGBTQ2S+; or have limited social support.

Limitations

Literature limitations. The literature reviewed above has limitations. The elements of GEM programs varied across studies. Many studies also lacked detail about the models on which they reported, and/or the care received by comparator groups. Studies used a range of methodological approaches, including both observational and experimental approaches, making direct comparison of findings challenging. We found no evidence pertaining directly to health outcomes, care experiences, or outcomes and experiences for informal carers; we found limited evidence relating to costs and implementation considerations. As such, the full range of outcomes of GEM merits further investigation.

Additionally, studies were predominantly conducted in urban areas the United States, and some studies focused on specific populations such as veterans or residents of aged care facilities. Many included samples with limited diversity, and no studies described cultural or other adaptations for equity-denied populations. As such, findings may not be generalizable to socially and geographically diverse older adult populations.

Search strategy approach and scope. Our rapid review approach also has important limitations. Our streamlined search used a focused search strategy on a few key terms in the title and abstract of two databases; therefore, it is likely we may have missed potentially relevant studies. We did not formally appraise the quality of the studies included, so we are unable to comment on the level of certainty in our findings. Finally, we used a staged approach when conducting this review and did not extract data from studies that were deemed less relevant to our core questions. This is a non-standard approach to reviewing and may introduce bias. For transparency, we have included a list of those “less relevant” studies in **Appendix 2**.

Considerations for Ontario decision-makers

Given the evidence and important gaps, the following considerations may be relevant to decision-makers in Ontario:

- **GEM is a promising approach, and further evaluation can clarify outcomes in the Ontario context**. Evidence suggests that GEM models reduces hospital admissions, and may also save costs. However, these impacts are likely to be influenced by the broader health and social service environment. Evaluation can determine whether similar impacts on utilization and costs are achieved in the Ontario context, and should also examine broader outcomes (e.g., quality of life, functioning, caregiver wellbeing, patient provider experiences) to fully understand the effects of GEM in context.
- **Integration with existing services and supports is key, but under-accounted for in academic literature**. The included literature provides limited detail on how GEM services integrate with health and social care beyond the ED, such as primary and community care. Nonetheless, resources developed by PGLO and its regional partners highlight that GEM functions as part of an integrated system of care, and may be supported by inter-organizational relationships and accountability agreements (North Simcoe Muskoka Specialized Geriatric Centre et al., 2023). Decision-makers adopting GEM can further

explore and disseminate approaches to integration that draw on local resource ecosystems and robust implementation supports.

- **Cultural adaptation and cultural safety**. The literature on GEM also provides limited insight into how GEM addresses the needs of diverse populations. One study suggests ongoing cultural safety and sensitivity training for geriatric interdisciplinary teams and administrators, to increase awareness of potential biases in care delivery (Chary et al., 2024). Decision-makers can further consider how GEM may be adapted to meet the needs of diverse patients and carers, including through tailored materials and program partnerships.
- **Rural and remote adaptations**. Implementing GEM in rural and remote areas may present unique challenges, including limited access both to specialists in EDs and appropriate community supports following discharge. Rural adaptations to GEM models (including use of remote technologies) can be piloted, evaluated, and shared to support access to GEM care across the province. These efforts may build on existing provincial resources to support acute care hospitals (such as CritiCall), and draw on lessons learned from implementation of these existing initiatives.

Conclusions

Evidence suggests that GEM programs can improve utilization outcomes such as reduced hospital admissions and readmissions, though findings for ED visits and revisits are mixed. A range of implementation factors such as resource availability and staff expertise are documented in the literature, along with strategies including ongoing education and monitoring. The included literature mainly addressed GEM programs within the American context, and did not capture literature with information on equity-affects or equity-related intervention adaptations within GEM for equity-denied older adult populations. Dissemination and implementation of GEM within the Ontario context may be supported by: further evaluation of GEM to better understand its effects in Ontario; description of the integration of GEM with existing social and health services; and exploration of adaptations of GEM for distinct cultural and geographic contexts.

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Appendices

Appendix 1: Methods

Structured search

We conducted a structured search to identify literature that focused on GEM models or programs serving senior patients. We limited our search to empirical studies in MedLine and PsycINFO using the following search string:

> ((Geriatric Emergency Management) or (Geriatric Emergency Medicine) or (Geriatric Emergency Department)).ti,ab

Eligibility criteria

Studies were eligible for inclusion in this report based on the following criteria:

- Available in English
- Published within the last 10 years
- Focused on GEM models of care and included the criteria 1 and 2 and at least one of 3-5 from the following list:
    1. based in the ED
    2. serving seniors 65 and older dealing with frailty, multimorbidity or complex needs,
    3. includes a specialized geriatric clinician or team
    4. includes a defined process for patient flow
    5. includes environmental modifications (e.g., a senior-friendly environment in the ED)
- Took an empirical approach
- Focused on the outcomes and implementation considerations of GEM models
- Conducted in high income countries

Studies were excluded if they:

- Were not available in English
- Focused on low- and middle-income countries
- Were a commentary, editorial, guideline, standard, or toolkit
- Focused on the delivery of a specific intervention or use of a specific tool within a GEM model
- Focused on GEM fellowships or other interventions for trainees, with the main focus on trainee career outcomes instead of model implementation

Study selection

Studies were identified through the structured search that underwent independent title and abstract screening followed by full-text reviews by research team members. All study conflicts were resolved through team discussions. A title and abstract screening pilot of 10 random studies was conducted at the start to ensure a shared understanding and application of inclusion and exclusion criteria among team members.

Data extraction

Data from each study was extracted by the research team. We extracted from the included studies deemed relevant:

- Study characteristics including study title, author(s), date of publication, and objectives.
- Contextual content including key population characteristics and reporting on the GEM model elements: a) based in the ED, b) serving older adults experiencing frailty, multi-morbidity, or complex needs, c) specifies if it includes a specialized geriatric clinician or team, d) specifies if it includes a defined process for patient flow, and e) specifies if it includes senior-friendly environmental modifications.
- Content on reported outcomes (health-related, costs, equity, utilization, patient, and provider or caregiver experience) and other types of findings, implementation factors (barriers and facilitators) and strategies
- Limitations, methodological concerns, and one sentence summary of findings

We conducted brief extractions in the second sheet of the extraction spreadsheet for 11 included studies that met the inclusion criteria but were later deemed non-relevant by the research team due to their limited relevance to our research scope. We then extracted briefly:

- Study characteristics including study title, author(s), date of publication, and objectives
- Contextual content regarding the reason for non-relevance by the research team (e.g., limited to no information regarding model outcomes and implementation considerations)
- Content on the summary of key findings

Appendix 2: Data extraction

Please see the attached Excel file, “Appendix 2: GEM data extraction”, which includes two sheets labeled “Relevant studies” and “Non-relevant studies.”