ISSN: 2754-6667

Journal of Critical Care & Emergency Medicine

SCIENTIFIC Research and Community

Review Article

Open Access

Deliberate Simulation Training with a Geriatric Focus

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ABSTRACT

The global increase in older adults poses immense challenges for both the healthcare system and social perspectives. They often have multiple long-term health-related issues, complex healthcare needs requiring tailored and anticipatory approaches. In this paper, we share our deliberate focus on geriatric simulation for training our healthcare providers and staff. This is with the intent to deliver patient-centred care for these older patients, who are both fragile and vulnerable. They also come with a multitude of medical conditions and co-morbidities which need to be managed in a customized fashion. These older persons are extremely dynamic in their needs and have atypical as well as complex presentations, which will differ from the younger patients.

Incorporating simulation-based education into the geriatric curriculum for Emergency Department staffs not only enhances clinical competence, interprofessional coordination, and decision-making in the acute care of older adults; it also aligns with the preparation to face the super-aged society Singapore is transforming into.

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Received: February 09, 2026; **Accepted:** February 16, 2026; **Published:** February 23, 2026

Keywords: Geriatric, Seniors, Simulation, Scenario, Standardized Patients

Introduction

Ageing is an irreversible global trend; the inevitable result of demographic transition. The number of persons aged 65 years and above globally was 761 million in 2021 and is projected to become 1.6 billion by 2050. If we consider those aged 60 years and above, the number would be 2.1 billion by 2025 Singapore is rapidly becoming a super-aged society [1-3]. By 2026, more than 1 in 5 of the population will be aged 65 years and above. This will make up more than 21% of the total population. Today, there are more than 145 000 seniors aged 80 and beyond; with over 25 000 being nonagenarians (aged 90 years and above) and some 1500 are centenarians (aged 100 and above) in the city state, which has a population of 6 million [4,5].

Transitioning to this Super-Aged Society Presents Multiple Challenges

- Healthcare cost expenditure will increase substantially
- The need to strategize and plan offerings in terms of healthcare related services
- Preparation for longer term care, with the increasing life expectancy
- Provision for more step-down care services and age-related care, targeting more community-based care for seniors
- Recognition and appropriate interventions based on the increasing needs and pressures on social services

Singapore has high life expectancy; 81.2 for males and 85.6 for females (2024), and had started planning early for this onslaught, utilizing a three-pronged approach: [6, 7].

- **Care of Seniors** this comprise of physical and mental health, preventive health, active ageing and offerings of adequate care services
- **Connectedness** this is the maintenance of contact and relationships with loved ones, families and society. The main aim is not to be isolated
- **Contributions** this is where seniors who continue to be active

or are working can actively share their experience and wisdom and make their contributions is a variety of ways

These must be viewed from a "whole of nation" and a "whole of government" perspective. Policies and governance must remain dynamic especially when it comes to housing policies, transport system planning, healthcare related funding, upliftment of community social services and even home-based care services. Economic growth must continue to address the increasing dependency in the population, with the significantly higher numbers of seniors, who are not economically active [4,5].

From the healthcare perspective, training must be projected to meet those needs. Higher numbers of generalists (eg. family physicians, emergency physicians), geriatricians, palliative care staff and allied health service providers must be trained. Strategic national and institutional plans to address the manpower shortfalls on the healthcare system must be anticipated and catered for early; to avert a potential 'crisis of care'.

The rising numbers of seniors comes with increased utilization of emergency care services. These seniors can present with acute and emergent problems; complications linked to their spectrum of chronic illnesses and a variety of other presentations. In many countries around the world today, the Emergency Medicine (EM) curriculum has incorporated Geriatric Emergency Medicine (GEM), combining didactic instruction with practical, competency based training. In Singapore, Emergency Physicians are also given the opportunities to develop their interest in sub-specialty areas (such as Disaster Medicine, Trauma Care, Prehospital and Emergency Medical Services, Paediatric EM). The area of GEM is becoming more popular as well and has been offered as a formal sub-specialty training or fellowship [8].

The Conceptualization of the Geriatric Simulation Training (Annex 1)

With advancing age, functional limitations, physical impairments as well as the multiple comorbidities may lead to prejudice and discrimination on the part of the younger cohorts, including healthcare providers. They may consider the elderly as different from them, fostering bias and devaluation. If the aging process is not understood and respected in its entirety, the clinical management and assistance provided may be fragmented and inadequate.

Our intent is to prioritize appropriate and timely management of the geriatric group of patients, especially the nonagenarians and centenarians presenting to the ED daily. This group of patients are extremely vulnerable and labile in their presentations and will require more rapid assessment with specialized considerations (e.g. atypical presentations, need for inter-professional and multidisciplinary approach to care) for effective management. Moreover, this group usually have complex medical history and co-morbidities. As a result of this, the conventional ED protocols, which tend to focus on single acute issues may be insufficient. The optimal management strategies must include implementing geriatric-specific assessment protocols, accelerated pathways to reduce waiting times, lowered threshold for a variety of diagnoses and safe transitions-of-care, as well as comprehensive discharge planning [9-13].

Our Objectives were

- To create awareness of possible and potential presentations in these seniors, including atypical and complex presentations
- To enhance the level of empathy amongst our healthcare providers delivering acute care to such geriatric patients
- To improve communication skills in these contexts
- To uplift common skills needed in managing geriatric patients
- To practice inter-professional geriatric care delivery, centred and commencing in the ED, and
- To conduct post training and post simulation debrief to uncover latent threats and change practice appropriately

Therefore, in planning the programme, writing the scenarios, training Standardized Patients (SPs) and curation of the workflow, all the above points were given appropriate weightage.

Geriatric Simulation Training Framework for ED Staff

Geriatric care is characterized by complex and multi-systems interactions which simulation-based education can assist to address. Simulation, as an educational methodology in geriatric training facilitate learning, unlearning and relearning of different concepts and promote novel thinking. Simulation training for geriatric patients can help learners develop their actual skills, both technical and non-technical, in managing complex cases. It is important to emphasize the physical, emotional and cognitive challenges these patients face. Simulation can help learners gain practical experience in addressing age-related issues and navigate complex clinical scenarios in care delivery [14-16].

We focused on the following scenarios that captures the "geriatric syndromes" which often require more nuanced clinical judgment

• Scenario Creation with Atypical Presentations (Annex 1, Annex 2)

Geriatric patients often present with non-specific and non-localizing symptoms, multiple co-morbidities as well as atypical manifestations of common conditions. ED staff need to be aware of this. For example, the Triage Nurse needs to understand this and not under- or over triage geriatric patients unnecessarily. Junior doctors need to be aware that not all geriatric patients with acute myocardial infarction (AMI) will present with chest pain. In fact, many may present with giddiness, dyspnoea, lethargy, confusion or reduction in effort tolerance instead High fidelity simulation provides a valuable opportunity to engage in realistic, multi-phase clinical scenarios. We also focuse on delirium and cognitive changes, whereby the geriatric patients with acute conditions primarily present with confusion and behavioural changes rather than classic symptoms. A patient with urinary tract infection (which is often seen in the geriatric patient group) may have sudden onset of agitation without fever or dysuria. Sepsis recognition can be challenging in these patients, and thus delayed or even missed. A term often used in these seniors is "functional decline", which means there is loss of physical and/or cognitive function, impacting the patient's ability to perform Activities of Daily Living (ADLs) such as bathing, dressing, and feeding. This may manifest acutely following minor illnesses and infection or develop over a period of time. It is a serious geriatric syndrome that can lead to a spiral of further decline, re-hospitalizations, increased dependence, and reduced quality of life, in general. A geriatric patient with pneumonia might present with inability to perform the ADLs rather than respiratory symptoms, whilst another patient with hip fracture may present with refusal to mobilise rather than any history of trauma or falls [14,17].

The simulation scenarios were developed with different levels of complexities; commencing with simpler ones and leading to more complex ones with multi-organ system involvement, reflecting the inter-dependence of geriatric health issues. We also included scenarios with issues where treating one condition may impact

another, requiring careful balance and prioritization [14-16]. For example, many of the drugs used in the management of sepsis or analgesia can impact the kidneys. Many geriatric patients have pre-existing chronic kidney disease or develop acute kidney injury during their illness, which require adjustment of drug dosage or alternative drugs [18].

For implementation, pre-briefing must be adequately provided to learners, set against realistic clinical background, with adequate information such as social history, baseline functional status, medication lists (many geriatric patients have polypharmacy complications), previous hospitalization as well as family dynamics and support system. For the more complex scenario we utilize progressive disclosure; i.e. the gradual release of information as scenario unfolds, mimicking real clinical progression in practice. We also build in critical decision points where learners must choose between diagnostic versus therapeutic approaches, with each leading to different outcomes [14,15,19].

• Training Standardized Patients (SP)

In geriatric simulation, manikins and also SPs can be utilized, depending on the scenario and the learning objectives. SPs have helped upliftment of fidelity in simulation-based training, especially with the use of hybrid simulation [18]. In some institutions SP recruitment and training has become a significant business and has a dedicated department. Today, they are used in healthcare training at all levels, assessment (both formative and summative) and even high stakes examinations. For geriatric simulation, age-appropriate SPs can be recruited or younger actors, dressed and trained with age-appropriate behaviours offer an attractive option. Retired healthcare workers, older adult volunteers and other community volunteers can also be recruited. The SPs need to be trained to portray physical limitations, mobility issues, gait changes, tremors, reduction in range of motion, hearing and visual impairment as well as appropriate cognitive demonstrations, based on the scenarios. They should be given some basic understanding of the conditions they are portraying to ensure realism in the roles. They may need to be taught how to use certain mobility aids. This will provide learners with more authentic experience and thus, response [15,19-21] When working with SPs, it is necessary to be vigilant about the following 5 underlying values and domains, as recommended by The Association for Standardized Patients Educators (ASPE) [21]

Underlying values: Underlying Domains

Safety Safe work environment
Quality Case development
Professionalism Adequate training of SPs
Accountability Proper programme management
Collaboration Professional development
Over and above all these values and domains, the psychological safety of the SPs must be maintained at all times.

Commercially available aging or geriatric suits are available today; however, they are costly. These can be self-made and customized for experiential learning and simulation, at very reasonable cost. Creativity and innovative ideas can be applied to demonstrate certain physical signs. Some examples are shared in Table 1 below:

Table 1: Example of Cheap Interventions to Incorporate into Geriatric Simulation

Enactment/ Intervention	To Demonstrate/ simulate:
Ankle/ wrist weights	Muscle atrophy, limitation of movements, fatigue with exercise. Weighted joints can mimic fragile patients
Ear Plugs	Hearing loss or reduction in hearing ability
Elbow braces	Reduction in mobility, arthritis
Knee braces	Pain, reduction in mobility, arthritis
Noise cancelling headphones	Hearing loss
Posture braces	Stooped posture (when applied backwards)
Plastic glasses/ spectacles	When coated with Vaseline/ cream, can demonstrate diminished vision, varying degrees of visual reduction
Thin or thicker gloves	For varying degrees of neuropathy and sensory losses
Slippers	Gait instability, neuropathy of the feet

Besides being used for geriatric simulation, these enactments (Table 1) can be adorned by staff who would like to experience and better understand what a geriatric patient feels as well as the challenges unique to the age group [21,22].

SPs may need to demonstrate communications pattern which include slow speech, garbled speech, difficulty with choice of words, difficulty hearing, difficulty seeing or certain cultural peculiarities. They need to be immersed in their roles, especially in showcasing the emotional aspects such as anxiety, emotional lability, grief over functional losses or even concern about their dignity and independence [19,20].

The use of checklists, customized to each geriatric scenario can be helpful. This ensures sufficient information is shared with the SPs as they internalize their roles. Checklists may also help with standardization across the different actors as often there is a need to run the same scenario for multiple groups of learners, simultaneously [14].

Finally, the SPs are a valuable source of feedback for learners' performance. They can provide constructive feedback on a spectrum of issues such as communications, engagement level, authenticity, demonstration of empathy and other non-technical performance [14,20].

• Ergonomic Simulation and Environmental Considerations

The geriatric scenarios are set against the background of realistic settings, such as in the ED, ICU, rehabilitation ward or in the community. The realistic ambient characteristics will enhance the realism. Concept like appropriate lighting, visual or tactile aids, non-slip flooring, grab bars, accessible furniture height and age-friendly designs can be incorporated. A wide variety of scenarios can be conceptualized; including those involved in proper transfer, positioning, lifting techniques or use of mechanical aids. Even better, would be to conduct in situ simulation, at the actual location such as homes, communities or healthcare facilities where these seniors are managed [14,23].

• Inter-Professional Collaborative Practice (IPCP) Teams Training

Geriatric care is inherently complex. The core team delivering comprehensive geriatric care is inter-professional (comprising of physicians, nurses, pharmacist, physiotherapist, dietician, social workers). The simulation must depict this team collaborative coordination and training. Each profession will bring their unique perspectives towards the wholesome care of the geriatric patient [17,23-27].

Simulation practice can help establish clear communications protocols, role clarities and escalation workflows. Seamless transfers and care transitions are also very popular geriatric care simulation scenarios since miscommunications can impact patient safety. For geriatric crisis management, scenarios such as acute delirium, falls with injuries or sudden clinical deterioration are common. These can test team dynamics, crisis leadership, communications under pressure and identification of latent threats. Another very popular theme for geriatric simulation is family conference simulation. This may involve designing scenarios with complex family dynamics, advanced care planning decisions, discharge planning and coordination of care, transitioning into community care. These situations all require inter-professional inputs and contributions [27].

Team assessment matrices provide a useful platform for use in teams training and simulation. The various domains can be graded and then discussed during debriefing. Inter-professional and teams training can be conducted in the simulation laboratory or in situ [13,24-27].

• End of Life Discussions

The Ministry of Health, Singapore has emphasized the need to enhance the quality of end of life care, fulfill the final wishes of geriatric patients, support for care-givers as well as pre-planning for end of life care through advanced care planning (ACP). This is in alignment with the onslaught of the super-aged population. Our scenarios for end of life discussions training included [4,5,7,28].

- **Advanced care planning:** scenarios with varying levels of cognitive capacity in discussing future care preferences; when family members disagree with patients' wishes or family members disagree among themselves.
- **Goals of care conversations:** scenarios with transition from curative to supportive and comfort focused care. Communications training on how to present options in a sensitive manner and ensure patient feels supported in their decision making is very important
- **Family Dynamics:** Scenarios with family situations such as estranged relations, cultural or generational conflicts in care approaches can be very engaging. It also can help staff experience how it feels to advocate for the geriatric patient.

• Medication Review and Reconciliation

Polypharmacy (the use of 5 or more medications) is very common among geriatric patients. Some problems with this include drug to drug, drug to organ interactions, missing medications and low compliance rates from high pill burden. (25) Reviewing some of the very chronically prescribed medications, which, may not be required or may need to be dose adjusted, is very useful, but many tend not to do this in view of time constraints. Time and patience will be required to go through the array of medications as well as give suitable advice and plans. The use of medication boxes, colour-coding and proper large labelling can also be simulated [9,11,28,29].

• Comprehensive Geriatric Assessment

This involves very elaborate assessment which can be commenced in the ED, but will need to be completed and followed through in the inpatient setting. It should be a very comprehensive list of assessment, encompassing the physical, emotional/ psychological, functional and social domains [12,29].

Other simulation scenarios which can be utilized and crafted appropriately include hand-off scenarios where realistic shift changes, transfers and care transitions can be simulated and effective communications emphasized as the main learning objective. Crisis management for very acute issues such as delirium or hypotension are also very popular with geriatric simulations [9,10].

For debriefing, both the clinical outcomes (diagnostic accuracy, appropriate medications and prescription as well as dosages) and humanistic outcomes (empathy level, appropriate listening and communications skills, attitude towards geriatric patients) can be covered. Some of these are practice and culture-specific and thus should be customized to your own setting. There is currently limited research to address and measure improvement in attitude towards geriatric patients amongst ED staff. With our focus on geriatric simulation training which will be conducted at regular intervals, we intent to conduct longitudinal follow up in terms of skills retention, geriatric assessment strategy and attitude/ feelings towards the older persons [11,29,30]. (Annex 3)

Using Technology and Artificial Intelligence (AI) in Geriatric Simulations and Scenario Creation

With the increasing use of AI in healthcare, education and training, it can facilitate scenario creation for geriatric cases. These can be very realistic and is able to mimic real life situation and encounters. Interactive chatbots are also available for use, with a wide variety of clinical encounters and scenarios that can be customized to meet specific learning objectives. Platforms such as ChatGPT, Pair and DeepSeek are very popular. A word of caution on using these platforms is that the simulation faculty should have oversight and edit as well as evaluate the appropriateness for each individual setting, on a case by case basis [31,32].

It is possible to use a prompt-based approach with AI platforms to generate a patient's medical history, condition, and interactive dialogue, then structure the content using a design template. Very realistic scenarios can be created by integrating age-specific challenges like frailty, polypharmacy, or cognitive issues, and incorporating elements such as AI-powered virtual humans with facial expressions and gestures to mimic a real interaction [32,33]. This allows learners to practice skills like communication, empathy, and clinical decision-making in a safe, reproducible environment. Whatever the scenario, the learning objectives have to be clearly defined [33].

Today, immersive technology such as augmented and virtual reality are increasingly used in geriatric simulation. This can enable learners to be exposed to a wider variety of scenarios and interaction with 'virtual older human'. This can also help with improving communications and interactions with actual geriatric patients [31].

Good Quality Geriatric Simulation

As geriatric simulation becomes more and more important and relevant, there is a need to ensure high standards and quality. The following represent the important goals to bear in mind if you

are planning such programmes for your ED or institution [34].

- To keep abreast of the developments in simulation and technology-enhanced learning, especially to tap on those which are relevant and can be applied to geriatric simulation education.
- To keep updated on the latest information and knowledge related to geriatric care
- To work with Geriatric Specialists in crafting scenarios and educational materials
- To plan adequate inter-professional training in the area of geriatric care. These simulations can also include some patients and family members who are appropriately briefed and prepared to participate, as this can uplift the realism
- Adequate debriefing after these simulation activities as this is the point where most learning or change in practice can occur
- Survey learners before and after the training, as their views and inputs are critical and central to planning future training.

As this is a pilot training programme we are embarking on, with a view to longer term utilization, we will be using the Kirkpatrick's Model to assess our outcomes measures. (Annex 3). To meet our 6 stipulated objectives (see earlier Section under The Conceptualization of the geriatric Simulation Training), departmental support and buy-in from all stakeholders is very important. We shared information on this at our peer-review sessions, ED townhalls, staff meetings and nurses roll call, as well as our Mortality and Morbidity Rounds, to create awareness and also gather feedback. A call for simulation trained faculty to assist was also made to assist with the conduct of the simulation and also debriefing sessions. The faculty will have to be role models for the junior staff to emulate, especially through their "hidden curriculum" and nonverbal communications [35]. At the same time, we also engaged our Geriatric Medicine colleagues for discussions on case scenarios and worked on some of the inter-professional elements we wanted to focus on.

Conclusions

High-quality geriatric simulations require proper and adequate conceptualization, meticulous planning, setting realistic learning objectives as well as regular reviews to keep abreast of the latest developments based on current evidence. With the ageing population across many countries worldwide, it is becoming imperative for medical curricula and training in medical specialties such as EM to integrate geriatric emergency management. Simulation-based scenarios can play a central role by deepening understanding, inculcating and fostering empathy, and finally enhancing confidence and comfort in managing the older persons, including nonagenarians and centenarians.

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