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Approach to Geriatric Emergency Medicine: A Flipped Classroom Group Learning Exercise for Undergraduate Medical Trainees

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## Approach to Geriatric Emergency Medicine: A Flipped Classroom Group Learning Exercise for Undergraduate Medical Trainees

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### ABSTRACT:

**Audience:** This module is designed for undergraduate medical students during the clinical stage of their emergency medicine training (eg, clerkship). With some modifications to make the objectives and content level appropriate, it may also be shared with postgraduate learners (eg, interns and residents).

**Introduction:** Adults aged 65 and older account for 25% of visits to emergency departments (EDs) in the United States (US), and 22% of ED visits in Ontario, Canada.<sup>1,2</sup> This share will undoubtedly increase in proportion to the growing number of seniors, who are expected to make up over 20% of the Canadian population by 2023, and 25% by 2047.<sup>3</sup>

As compared with younger ED patients, older adults are more vulnerable in that they:<sup>4,5,6</sup>

- Experience high rates of post-visit morbidity, mortality, and functional decline.
- Are more likely to be admitted to hospital.
- Are prone to health care-related harm in the ED.
- Are predisposed to conditions such as delirium and dementia, which can complicate their clinical course and discharge planning.

Factors that account for these differences include:

- Normal age-related decrements in homeostatic response to physiologic stressors like infection and hypovolemia.<sup>7</sup>

# SMALL *groups*



- Tendency to present with nonspecific symptoms such as fatigue, weakness, dizziness, confusion, or “feeling unwell,” with causes that require time and careful inquiry to uncover.<sup>8</sup>
- Higher prevalence of cognitive impairment, which makes it difficult for patients to describe symptoms and convey past medical history.

Clinician-scientists in geriatric emergency medicine (GEM) have produced primary research and evidence-based guidance to inform safe care of older adults and clear recommendations regarding core GEM competencies for postgraduate medical education (PGME), which have relevance in the undergraduate medical education (UGME) as well.<sup>9</sup> Notably, the Academy of Geriatric Emergency Medicine recently published a comprehensive review of the state of GEM education, including a range of practical suggestions to improve how GEM competencies are taught.<sup>10</sup>

Yet GEM remains poorly represented in both PGME and UGME emergency medicine (EM) curricula.<sup>11</sup> The reasons for this deficiency are numerous, and likely include the way that EM has historically defined expertise, and a persistent sense that care of older adults is beyond EM physicians’ scope of responsibility in the busy ED setting.<sup>10</sup>

Our project is addressed not to these larger challenges, but to the needs of the clinician educator who already includes care of older ED patients in their UGME EM curriculum and needs practical guidance in developing teaching materials. The overall goals are to introduce undergraduate medical students to several practical applicable GEM principles, and improve undergraduate medical students’ comfort with the medical and psychosocial complexity of older ED patients. This module is a self-contained, interactive, learner-driven small group exercise intended to introduce learners to some key principles of safe care of older ED patients.

**Objectives:** At the end of the module, learners should be able to: 1) recognize that many benign-seeming presentations, including restricting fatigue and cognitive decline, can have serious and life-threatening causes, 2) describe the importance of screening for delirium in older ED patients, 3) identify situations in which vital signs can be misleading in older adults and know strategies to further investigate such data, and 4) recognize that older adults can rapidly develop delirium in the ED and be able to apply strategies to reduce risk of delirium.

**Methods:** This exercise consists of a small group session that uses a “flipped classroom” design. The facilitator should distribute the learner responsible content one week in advance. The learner responsible content consists of: 1) a PDF file titled *A Primer on GEM*, and 2) a student handout presenting two GEM cases.

Learners are instructed to review the primer and the cases in order to lead an in-class discussion. Questions are included to guide their critical engagement with the cases and to structure the subsequent small group session. Students are encouraged to access supplemental resources, including free open access medical

# SMALL *groups*

education (FOAM) materials such as podcasts and blog posts, journal articles, textbooks, videos, and interactive media.

The one-hour small group session is a structured learner-led critical discussion of the two cases, guided by the facilitator, using a discussion guide to surface key learning points. At the beginning of the session, the facilitator splits the class into two groups, each with responsibility for one case. Learners have twenty minutes to discuss the cases, share their insights, and prepare the discussion, including a short outline or list of bullet points. Students are encouraged to address the questions in the handout. The facilitator uses the *GEM Cases: Facilitator Guide*, organized around the handout questions, to stimulate discussion and answer questions.

**Topics:** Geriatric emergency medicine, cognitive impairment, delirium, dementia, atypical presentation of disease, falls, orthostatic vitals, gait assessment, elder abuse, flipped classroom, group learning.



# USER GUIDE

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## Learner Audience:

Medical Students

## Time Required for Implementation:

Learner Responsible Content: 60 minutes total

- 10 minutes to review the document title *A Primer on GEM*
- 50 minutes to review the two cases (“Case 1: Mr. Thompson” and “Case 2: Ms. Lam”) presented in the student handout

Small Group Session: 60 minutes total

- 20 minutes for learners to review their assigned case collectively and prepare to lead a group discussion.
- 20 minutes for Group A to present and lead a discussion on Case 1.
- 20 minutes for Group B to present and lead a discussion on Case 2.

**Recommended Number of Learners per Instructor:** 10 to 12 learners are ideal, but it is possible to run with a larger group

## Topics:

Geriatric emergency medicine, cognitive impairment, delirium, dementia, atypical presentation of disease, falls, orthostatic vitals, gait assessment, elder abuse, flipped classroom, group learning.

## Objectives:

At the end of the module, learners should be able to:

1. Recognize that many benign-seeming presentations, including restricting fatigue and cognitive decline, can have serious and life-threatening causes.
2. Describe the importance of screening for delirium in older ED patients.
3. Identify situations in which vital signs can be misleading in older adults and know strategies to further investigate such data.
4. Recognize that older adults can rapidly develop delirium in the ED and be able to apply strategies to reduce risk of delirium.

## Linked objectives, methods and results:

A flipped classroom framework places greater onus on the learner.<sup>11</sup> Learners are required to review educational material prior to in-class sessions to allow more in-class time to explore applications of the content.<sup>12</sup> Previous literature has shown that flipped classroom curricula can improve student learning. Where this framework has been applied in undergraduate emergency medicine education, students report enjoying the discussion, interactivity, and critical thinking.<sup>13</sup>

Further, it has been demonstrated that interactive and case-based learning is particularly effective for the teaching of GEM principles.<sup>14</sup> We used a flipped classroom, group-learning framework to develop our content to improve student learning and engagement through an interactive, discussion-based approach. The objectives will be presented didactically through the learner responsible content titled *A Primer on GEM* and further applied during the in-class discussion.

In preparing case one, learners will discuss a case of a benign seeming presentation and the importance of screening for delirium in older ED patients (objectives 1 and 2). In preparing case two, learners will discuss a case of a geriatric patient with misleading vital signs at risk of rapid deterioration (objectives 3 and 4). Strategies to reduce the risk of delirium will also be discussed in the second case (objective 4).

## Recommended pre-reading for instructor:

The facilitator should review the two cases in the student handout as well as the document titled *GEM Cases: Facilitator Guide* prior to the small-group session, especially the questions at the end of each case which students will use to guide their presentations. Facilitators can augment this outline with their own observations and guiding questions.

## Learner responsible content (LRC):

- Learners should be instructed to review the PDF titled *A Primer on GEM* prior to the small-group session.
- Learners should also be instructed to briefly review the small group application exercise titled *GEM Cases: Student Handout* in preparation for the in-class discussion.
- The LRC should be provided to learners a minimum of one week before the small-group session to allow adequate time for review.

## Necessary Technology

A computer is required for students to access and review the PDF titled *A Primer on GEM* prior to the small-group session. No technology is required during the small-group session. However, paper copies of the small-group application exercise should be made available to learners.



# USER GUIDE

## Small Group Application Exercise (sGAE)

The sGAE includes two cases designed to encourage learners to apply the five key principles of GEM, as outlined in the primer. The small-group session is meant to generate discussion among peers and facilitate critical-thinking about clinical GEM.

### Results and tips for successful implementation:

An early version of this small-group curriculum was presented to a group of approximately 30 undergraduate trainees from multiple Canadian medical schools at the National Geriatrics Interest Group Student Day at the Annual Scientific Meeting of the Canadian Geriatrics Society in April, 2018, in Montréal, Québec, Canada. Participants included a mix of pre-clerkship and clerkship students, including some with no EM exposure. It was one of three 20-minute workshops.

A preliminary version of the “Ms. Lam” case was used as a prompt to elicit critical thinking and discussion about care of older adults and to convey practical lessons for undergraduate learners, including thoughtful interpretation of vital signs, attention to signs of delirium, and responsible discharge planning.

We gathered feedback through spontaneous informal focus groups with participants after the event which was generally positive. Students commented on the fact that GEM training is lacking in medical school. Indeed, several were surprised by the existence of GEM as a subspecialty. Many were surprised by the deceptive simplicity of the case and interested to discover the many nuances lurking behind a benign-sounding clinical scenario.

Based on the initial project, we offer the following suggestions to help implementation:

- Create a safe learning space through open discussion and engagement with students.
- Maximize the time available to students to review and discuss the cases together.
- Address any factual details and misunderstandings.
- Speak less and listen more! Let the students’ thoughts and questions guide your approach.
- It is better to have learners fully engaged and curious than to “get through” every teaching point on your agenda.
- Use the workshop as an opportunity to fight negative attitudes towards individuals that exist in health care by showing that care of older adults is meaningful, intellectually challenging, and life-changing.

## Summary of Key Learning Points

1. **Vague symptoms can signal serious pathology.**  
Always explore them further.
2. **Be a vital signs stickler!**
  - a. Always check orthostatic pressure and pulse.
  - b. Assess oxygen saturation and heart rate with a walk test.
  - c. Absence of fever does not rule out a serious infection; fever without symptoms is still concerning.
3. **Screen twice for delirium.**
  - a. In addition to screening for delirium early in an older adult’s ED visit, it is important to be vigilant for delirium which develops in the ED, either as a result of the present illness and/or due to iatrogenesis and the ED environment. Because delirium is easily missed, a second screen for delirium is a key part of reassessment, particularly in the setting of a prolonged ED visit.
  - b. Remember that lethargy, somnolence, and decreased movement are not normal responses to anxiety or illness. They can signal hypoactive delirium, which is often overlooked or misdiagnosed, and still requires urgent investigation.
4. **Watch for geriatric red flags.** Explicitly consider serious pathologies in all older adults presenting with the following benign-appearing presentations, which you should not (without inquiry) assume are chronic nor dismiss as normal age-related changes:
  - a. Acute functional decline
  - b. Restricting fatigue
  - c. Significant cognitive impairment
  - d. Falls
  - e. Incontinence and constipation.
5. **Prevent harm.** As a medical student, you often have the time to get to know patients well. Moreover, one of your key responsibilities is to reassess patients frequently. Because you often see the patient first and for longer, you may have a better sense of the patient’s condition than your attending or supervising resident, particularly as it changes over time.

## References/suggestions for further reading:

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## LEARNER MATERIALS

# Approach to Geriatric Emergency Medicine

## Small Group Session

### STUDENT HANDOUT #1

#### Case 1: “Mr. Thompson”

##### **Narrative**

Mr. Thompson is an 84-year-old man who presents to Youngfellow General Hospital at 23h00 feeling “weak and dizzy.” He is triaged as Australasian triage score (ATS) 5 (ie, non-urgent) and re-located to stretcher 17 in a crowded hallway. His daughter, Linda, is at bedside.

On history, Mr. Thompson is irritable and dismissive. He answers every question with “no” and eventually falls asleep. Collateral history is collected from Linda who states the following:

“Well, I went by his house this morning on my way to work to say hello, and I noticed the kitchen was very messy. It was clear he hadn’t showered or eaten his breakfast, which is weird for him, because he used to be in the military and always follows a very strict schedule. I asked him how he was doing, and he said he felt okay. He’s kind of a man of few words — been that way his whole life, I think. Before I left, I set out breakfast for him, and told him he should eat. Anyhow, he seemed a bit off, so I went to see him again during my lunch break. He hadn’t touched the food I had laid out, and in fact he had gone back to bed. He seemed really sleepy, and was even less talkative than usual, but said he felt fine and seemed pretty uninterested in my questions. I was definitely concerned, so I drove by later this evening to check on him one last time in the evening, and now things were really strange. He seemed really scared and actually was calling out for my mom, Susan, who died two years ago. He also seemed not to recognize me. He kept picking at his bedsheets, and when I asked him why, he said ‘there’s cobwebs everywhere.’”

On review of systems, Linda denies that Mr. Thompson has ever complained of headache, vertigo, presyncope, cough, shortness of breath, chest pain, abdominal pain, nausea, vomiting, or diarrhea.

She provides you with a note from Mr. Thompson’s family doctor that outlines his past medical history and medications as follows:

##### Past Medical History

1. Myocardial infarction (MI) in 2012
2. Hypertension
3. Dyslipidemia
4. Non-insulin dependent type 2 diabetes mellitus
5. Insomnia





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## Medications

1. Ramipril 5 mg orally (PO) twice daily (BID)
2. Aspirin 81 mg PO once daily
3. Atorvastatin 20 mg PO once daily
4. Metformin 500 mg PO once daily
5. Temazepam 15 mg PO once daily

## Social History

Linda tells you that Mr. Thompson is a retired engineer with the Canadian Armed Forces. His wife of 50 years, Susan, passed away two years ago from colon cancer. Linda is his only child, and she lives about ten minutes away. He has a 25 pack-year smoking history, but has been smoke-free for the past ten years. He does not drink alcohol or use recreational drugs.

Up until about a month ago, he enjoyed gardening and playing the piano, but now he spends the majority of the day lying on the sofa, watching television. Linda explains that Mr. Thompson used to go to a veterans' meeting at the Legion Hall every Saturday, where he has a few old friends, but lately he's been saying he'd rather stay at home.

## Functional Inquiry

Linda explains that Mr. Thompson has become more forgetful since the passing of his wife. Although he is able to dress, bathe and use the toilet without assistance, he requires assistance managing his finances. Linda assists him with cooking and cleaning, which was previously done by Susan.

## Mobility

Mr. Thompson doesn't use a cane or a walker, and he still drives, although Linda expresses concern about his ability to drive safely.

## Vital Signs

### At Triage

Temperature (T): 37.3 °C  
Heart rate (HR): 88 beats/min  
Blood pressure (BP): 143/91 mmHg  
Respiratory rate (RR): 16/min  
Oxygen saturation (O<sub>2</sub>sat): 98% on room air

## **Assignment:**

At the small group session, you will be working through Mr. Thompson's case. You'll have 20 minutes to discuss, and then a member or members of your team will "present the case" to your ED "preceptor" (ie, the rest of the class). Please come prepared to discuss the case.

To guide your preparation, here are some important questions to consider:

1. What is the headline? That is, how would you describe Mr. Thompson's presentation in just one sentence?



## LEARNER MATERIALS

2. What is the role of family members, such as Linda, when gathering a history from older adults?
3. What are geriatric red flags? What red flags exist in the case of Mr. Thompson?
4. What could explain the patient's signs and symptoms?
5. What are serious and potentially life-threatening causes for his presentation?
6. Given you have only 20 minutes to do your exam and write your note, what are your top priorities on physical examination?
7. What tests are you thinking about ordering? Keep in mind it's late at night, the lab is very busy, and there are ambulances lined up down the block. Some tests are going to take a significant amount of time to result. Make sure your list is prioritized.

### Resources:

Feel free to use whichever articles, books, blog posts, podcasts, or videos that you find helpful. Favour sources that cite to higher-quality evidence or expert opinion.

The following are some recommended resources:

- <https://emergencymedicinecases.com/episode-34-geriatric-emergency-medicine/> (Review the section titled "Delirium in the geriatric patient.")
- <https://geri-em.com/cognitive-impairment/screening-for-delirium/> (Review the sections titled "Delirium" and "Dementia.")



## LEARNER MATERIALS

# Approach to Geriatric Emergency Medicine

## Small Group Session

### STUDENT HANDOUT #2

#### Case 2: “Ms. Lam”

#### Narrative

It’s 15h55 on a Friday. You are about to start your shift in the acute care zone at King Lear General Hospital. The off-going resident approaches you in the consult room for handover as follows:

“Hey, I’ve got a quick one to hand over to you. Ms. Lam is an 85-year-old woman brought by paramedics from a long-term care home. The staff found her on a carpeted hallway, and it looked like she kind of slid out of her wheelchair and ended up on the floor. No one saw it happen, and she doesn’t remember any details, but she says her head doesn’t hurt, she’s been Glasgow coma scale (GCS) 15 and oriented the whole time, answering questions and everything. She’s just complaining of a sore left shoulder. She has Parkinson’s disease but she says she’s healthy except for maybe an old heart problem, probably an MI from the sound of it, a long time ago. She didn’t bring her medications with her but it is probably just carbidopa-levodopa. Vital signs are pristine, she looks great. My physical exam is on the chart, nothing to worry about. Anyways, she’s been sitting back in major 6 for like 8 hours and was waiting in offload for about two hours before that, so you should probably see her first, let her know she’s good to go, and then arrange transport back to the long-term care home.”

The patient’s chart is included as a Supplement at the end of this handout. It includes a brief note about the resident’s encounter and concludes with the diagnosis “shoulder injury.” The note suggests that Ms. Lam is in no acute distress, alert and oriented to place, person and self.

When you reassess her, your observations differ greatly from those documented in the chart. At the time you see her, Ms. Lam is diaphoretic, agitated, crying out, and swatting at the air in front of her. She begins to settle over time though her answers are mostly unintelligible and tangential.

When you enquire about these apparent changes to Ms. Lam’s condition, the nursing staff offers the following:

“She just got like this maybe two hours ago, out of nowhere. Now her answers make no sense and she’s really upset. She also keeps trying to take out her Foley catheter. I’m worried she’s going to hurt herself or maybe someone else. Do you want me to give her some lorazepam and maybe get soft restraints?”

The nurse obtains a set of vitals:

Temperature (T): 37.9°C

Heart rate (HR): 98 beats/min

Blood pressure (BP): 165/101 mmHg



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Respiratory rate (RR): 24 resps/min

Oxygen saturation (O<sub>2</sub>sat): 92% on room air

## Assignment:

At the small group session, you will be working through Ms. Lam's case. You'll have 20 minutes to discuss, and a member of your team will "present the case" to your ED "preceptor" (ie, the rest of the class). Please come prepared to discuss the case.

To guide your preparation, here are some important questions to consider:

1. Why do you think this patient was handed over as an "open and shut case?"
2. Are you worried about this patient? Why or why not?
3. What could explain the patient's signs and symptoms?
4. What do you think about the patient's vital signs?
5. What do you think about the idea of giving this patient lorazepam and putting her in soft restraints?
6. With the benefit of hindsight, if you were the first resident, what might you have done differently?
7. What supports exist for geriatric patients in the ED?
8. What does Ms. Lam's case, as well as your own experiences on this or other rotations involving acute care of older adults, reveal about gaps in our current practices?

## Resources:

Feel free to use whichever articles, books, blog posts, podcasts, or videos that you find helpful. Favour sources that cite to higher-quality evidence or expert opinion.

Here are some recommended resources:

- <https://emergencymedicinecases.com/episode-34-geriatric-emergency-medicine/> (Review the section titled "Falls in Geriatric Emergency Medicine.")
- <https://geri-em.com/trauma-falls/falls/> (Review the sections titled "Emergency Management of Falls" and "Prevention of Future Falls.")



# LEARNER MATERIALS

## Case #2: ED Facesheet (Ms. Lam)



KING LEAR  
MEMORIAL HOSPITAL  
"In jest, there is truth"

ED Record

Affix Patient Label Here

**LAM, DINAH**  
DOB 1933/02/17 85F  
51 STORMY HEATH BLVD.  
BURGUNDY, ON L1L2L3  
(555) 555-1234

Time Seen (H:M) Physician/NP/PA  
9h34 Gloucester PGY1

**History & Chief Complaint**

ID/84F CC/ L shoulder hurts

PMHx/ PD, heart issue ? MI (old)

HPI / slid out of wheelchair onto  
carpet, Ø witnessed, landed on L  
shoulder, now sore

Did Ø hit head, Ø head pain, Ø  
LOC, ØN/V

now feels @ baseline  
wants to go home

Ø/ AVSS NAD A&Ox3, looks comfortable  
PERRLA, Ø facial trauma, Ø signs skull #

L delt sore to touch, flex/ext/AB/ADduction WNL, sensation

WNL, Ø compartment signs

A/ L shoulder injury Ø #

P/ home, acetaminophen PRN, f/u w/ GP

POCUS (site +/-):

X-Ray/CT

ECG:

Fecal Occult Blood:

Visual Acuity R L

**Staff Physician Notes**

*Agree w/ above  
Ø #*

Discharge Time (H:M)

**Discharge Disposition**

**Prescriptions**

**Discharge Instructions**

- Info sheet given
- Instructed to return if symptoms worsen
- Other Instructions:

Diagnosis

Fax Chart to:

**Follow Up**

Family MD

Other:

Physician/NP/PA/trainee

Print Name

Physician/NP/PA/trainee

Signature

Attending Physician

Print Name

Attending Physician

LEARNING TOOL – NOT A MEDICAL DOCUMENT

LEARNING TOOL – NOT A MEDICAL DOCUMENT



# LEARNER MATERIALS

## Case #2: ED Order Sheet



KING LEAR  
MEMORIAL HOSPITAL  
"In jest, there is truth"

ED Record

Clearly imprint patient identification card

LAM, DINAH  
DOB 1933/02/17 85F  
51 STORMY HEATH BLVD.  
BURGUNDY, ON L1L2L3  
(555) 555-1234

ALLERGIES (REACTION)  NONE Preferred Name  
*NKDA* *Dinah*  
Preferred Pronoun  
*She/her/Ms.*

Under Mental Health Act  
 Police Badge# \_\_\_\_\_ Division # \_\_\_\_\_  
 Ambulance Patient TOC Time \_\_\_\_\_ (HH:MM)  
 Security called to watch patient at \_\_\_\_\_ (HH:MM)

Time (HH:MM)	RR	SpO <sub>2</sub>	HR	BP	Temp	GCS	Pain	
07h17	24	92%	98	165/101	37.9	15	0	<i>Well appearing, NAD, A&amp;Ox3</i>

Time (HH:MM)	Triage Reassessment
09h03	<i>Looks OK, comfortable on stretcher at offload 9 - Carson RN</i>

Primary Medication History	Dose	Freq.	Primary Medication History	Dose
<i>"parkinson's drug" ?</i>				

See also Triage Record medication list  The patient meets the criteria for medication reconciliation  
Tetanus Status  Not known  less than 10 years  greater than 10 years

Order	Time (HH:MM)	RN	Time (HH:MM)	Order	Time (HH:MM)	RN	Order	Time (HH:MM)
				CBC, Lytes, Cr, Glucose			Urea	
				G & S			BNP	
				INR / Ptt			Ca, Mg, Ph	
				TropT			CRP	
				LFTs			ESR	
				Blood cultures			Urinalysis	
				serum lactate			Urine C&S	
				VBG			Urine tox	
				Serum hCG			Serum ETOH	
				ECG			Serum ASA & Acet	

Consultation 1	Consultation 2
Request Time (HH:MM)	Request Time (HH:MM)

Procedure Notes  
Local/NB  See above

Restraints PRN \_\_\_\_\_

Repeat ECG and Cardiac Markers at \_\_\_\_\_

Date	Time	Print Name	Signatures
(YYYY MM DD)	(HH:MM)	_____	_____
(YYYY MM DD)	(HH:MM)	_____	_____

LEARNING TOOL - NOT A MEDICAL DOCUMENT

LEARNING TOOL - NOT A MEDICAL DOCUMENT



# LEARNER MATERIALS

Legend:

Abbreviation	Definition
∅	No/none
@	At
#	Fracture
A/	Assessment
AB	Abduction
AOx3	Awake, alert, oriented to person, place, time
AVSS	Afebrile, Vital Signs Stable
CC	Chief complaint
Delt	Deltoid
Ext	Extension
F	Female
F/u	Follow-up
Flex	Flexion
GP	General practitioner
H	Hours
HPI	History of presenting illness
ID	Identifying information
L	Left
LOC	Loss of consciousness
MI	Myocardial infarction
N/V	Nausea/vomiting
NAD	No acute distress
NKDA	No known drug allergies
O/	Objective
P/	Plan
PERRLA	Pupils equal and reactive to light and accommodation
PGY1	Post-graduate year 1
PMHx	Past medical history
PRN	As needed
RN	Registered nurse
w/	With
WNL	Within normal limits



# INSTRUCTOR MATERIALS

## Approach to Geriatric Emergency Medicine

### Small Group Session

#### FACILITATOR GUIDE #1

#### Case 1: “Mr. Thompson”

##### Overview

Mr. Thompson is an 84-year-old retired engineer with the Canadian Armed Forces who presents to the emergency department feeling “weak and dizzy.” He is agitated and appears to show signs of acute cognitive impairment on initial screening (ie, dizziness, confusion, agitation, fogged memory, potential lack of awareness).

He refuses to answer questions about his presenting complaint. However, his daughter, Linda, provides collateral. Linda mentions that her father has been acting differently over the past two weeks. Specifically, he is less active, has lost his appetite, prefers to stay alone in his bed rather than socializing with his friends, is less talkative, appears to be confused and had trouble remembering his own daughter the morning before he was brought to the ED.

Upon initial screening, Mr. Thompson has had a history of multiple comorbid conditions including: Myocardial infection (2012), hypertension, dyslipidemia, non-insulin dependent T2DM and insomnia. Linda provides a list of his current medications, which include: ramipril, aspirin, atorvastatin, metformin and temazepam.

The attending has given the student the responsibility of performing a targeted physical examination and choosing investigations appropriate for Mr. Thompson’s current presentation.

##### Sample Objectives

While there are multiple learning objectives that an instructor may relate, here are some specific objectives that the case was designed to address:

- It can be difficult to distinguish delirium from dementia in the ED. Older adults who present in the ED often have baseline dementia. The challenge of the emergency physician is to assess for acute cognitive impairment that could indicate delirium. Delirium almost always has one or more reversible causes that need to be identified, investigated and addressed in the ED.
- It can be helpful to call others for collateral. Older adults who present in the ED with cognitive impairment may be unable to provide a salient history. In these cases, calling others such as family, friends, long-term care employees and/or health aids (if applicable) can be critical for a thorough workup.
- The DIMES acronym can be used to remember the common causes of delirium. The DIMES acronym includes drugs, infection, metabolic, environmental and structural causes of delirium.
- Delirium often has one or more reversible cause(s) that must be identified and investigated in the ED and the patient often admitted for further management. A focused physical examination and





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investigations are needed to distinguish the cause of delirium in older adults. It is important to rule out life-threatening causes and intervene early.

- Absence of fever does not rule out serious infection. Older adults, especially those with a comorbid illness, often won't produce a fever in response to an infection. Suspect infection whenever there are clinical symptoms and signs. By the time an older adult is febrile, they may be seriously unwell, or even septic. Conversely, when seeing an older ED patient with a fever, don't be reassured by the absence of infectious signs or symptoms (eg, cough, sputum production, chest pain, nausea/vomiting, diarrhea, rash, abdominal pain, urinary symptoms, etc.).
- Recognize that significant cognitive impairment is a red flag sign in older adults.
- Patient should be assessed to clarify what the presenting impairments are (eg, memory, orientation, judgment, speech, dizziness, fatigue, behavior change, altered mental status, etc.) Next, determine if the changes are chronic or acute because that will help you define your approach (Table 1).
- Screen for delirium using the Confusion Assessment Method (CAM), an evidence-based tool that allows clinically to quickly and accurately identify delirium.<sup>1</sup> A positive CAM screen, suggesting a diagnosis of delirium, is made if patients have features of 1 and 2, and either 3 or 4 as follows:
  - Acute onset and fluctuating course
  - Inattention
  - Disorganized thinking
  - Altered level of consciousness
- Involve caregivers whenever possible to tailor your approach for the patient. Caregivers can be an essential source of information about recent health, functioning, and medications. As a medical professional, you should ask and take into consideration what caregivers think, feel and need to be able to customize a treatment plan for the patient.

Table 1. Differentiating acute versus chronic presentations of cognitive impairment.

Term	Definition
Acute	Sudden onset cognitive impairment.
Chronic	Cognitive impairment that develops over a longer duration of time.
Acute on chronic	Sudden decline in cognitive function that occurs in addition to pre-existing, long-term cognitive impairment.

## Discussion Guide

Students' presentation should be guided by the prompts they were given. Here are some points you can introduce to help provoke critical thinking and discussion.

1. What is the role of family members, such as Linda, when gathering a history from older adults?
  - Older adults presenting with cognitive impairment may be unable to provide a salient history. A good history is critical to developing a working diagnosis and in guiding management decisions.
  - In these situations, collateral information can be obtained from family, friends, other healthcare professionals, long-term care workers and/or health aids (if applicable).
2. What is the headline? That is, how would you describe Mr. Thompson's presentation in just one sentence?
  - Mr. Thompson is presenting with acute on chronic cognitive impairment.



# INSTRUCTOR MATERIALS

- It is often difficult to differentiate acute delirium from baseline dementia in the ED. It is important to identify superimposed delirium in older adults, as delirium often has one or more reversible causes that must be identified, investigated in the ED.
  - Encourage the students to explore the signs and symptoms of acute, chronic and acute on chronic cognitive impairment and relate them to the case.
3. What are geriatric red flags? Which ones are present in Mr. Thompson's case?
- Geriatric red flags include:
    - Acute functional decline: Ask about the specific activities of daily living. It is important to understand the patient's baseline and to establish the time course of decline.
    - Restricting fatigue: May be a symptom of hypoactive delirium, heart failure, malignancy, and inflammatory conditions, such as giant cell arteritis.
    - Significant cognitive impairment: Determine whether the impairment is acute or chronic to develop a differential diagnosis (Table 1).
    - Falls: May be a result of heart block, hypovolemia, or dangerous medication.
    - Incontinence: May be caused by stroke, head injury, infection, or spinal cord compression.
    - Constipation: May be caused by obstruction, depression, dehydration, or malnutrition.
4. Mr. Thompson presents with several red flags that require urgent investigation including acute functional decline, restricting fatigue, and significant cognitive impairment.
5. What are serious and potentially life-threatening causes for his presentation?
- Students can use the acronym "DIMES" to remember the causes of delirium.
    - **D**rugs:
      - Prescription medications:
        - Sedatives (eg, benzodiazepines)
        - Anticonvulsants
        - Analgesics (eg, opioids, nonsteroidal anti-inflammatory drugs [NSAIDs])
        - Antidepressants (especially tricyclics)
        - Antiarrhythmics
        - Antihypertensives
        - Alcohol and recreational drugs (including withdrawal or accidental overdose)
        - Over-the-counter medications (eg, antihistamines, antiemetics)
      - Infection ("PUS" denotes the most common sources):
        - Pneumonia
        - Urinary tract infection
        - Skin (eg, cellulitis, infected decubitus ulcer, diabetic foot infection)
      - **M**etabolic (eg, hypokalemia, hypernatremia, hypothyroidism, diabetic ketoacidosis, etc.)
      - **E**nvironmental (eg, hypo- or hyperthermia, stressful life events, impaired hearing or vision)
      - **S**tructural (eg, pain from injury or other sources, intracranial hemorrhage, ischemic stroke, myocardial infarction, constipation, urinary retention)
6. Given you have only 20 minutes to do your exam and write your note, what are your top priorities on physical examination?



## INSTRUCTOR MATERIALS

- Be a vital signs stickler. Check RR, pulse, O<sub>2</sub>sat with a walk test. Have the patient walk 50m and reassess their vitals. Older adults have decreased metabolic requirements. A significant drop in O<sub>2</sub>sat or increase in RR after walking a short distance is concerning. Check orthostatic vitals as follows:
  1. Have the patient lie down for 5 minutes
  2. Check blood pressure and pulse
  3. Have the patient stand
  4. Repeat the blood pressure after standing for 1 and then 3 minutes.

A drop of greater than or equal to 20mmHg systolic, or 10mmHg diastolic, is considered abnormal. Orthostatic hypotension could indicate a life-threatening arrhythmia or hypovolemia.

- Screen for delirium. The Confusion Assessment Method is an evidence-based tool that allows clinicians to quickly and accurately identify delirium.<sup>15</sup> A positive CAM screen, suggesting a diagnosis of delirium, is made if patients have features of 1 and 2, and either 3 or 4 as follows:
  1. Acute onset and fluctuating course
  2. Inattention
  3. Disorganized thinking
  4. Altered level of consciousness.

While useful, this tool screens for delirium in a specific moment in time. It is known that 25% of functionally independent community-dwelling older adults develop delirium within 12 hours of arriving in the ED.<sup>15</sup>

- Neurological exam. Look for signs of stroke or hemorrhage that require urgent intervention (eg, loss of consciousness, confusion or disorientation, dizziness, ataxia, vision changes, dysphagia or dysarthria, focal neurological signs, etc.).
  - Cardiorespiratory exam. Look for signs of acute cardiac distress, which can be fatal (eg, chest pain, shortness of breath, diaphoresis, dizziness, etc). Look for signs of pulmonary infection, which is a common cause of delirium in older adults (eg, dyspnea, cough, fever, sputum, chest pain, etc).
  - Screen for vision and hearing impairment. Vision and hearing are often not optimized in older adults, which can contribute to delirium.
7. What tests are you thinking about ordering? Keep in mind it's late at night, the lab is very busy, and there are ambulances lined up down the block. Some tests are going to take a significant amount of time to result. Make sure your list is prioritized. It is important to select interventions judiciously to conserve time and resources, while also ruling out life-threatening conditions.
- Complete blood count (CBC) with differential, basic metabolic panel (BMP) and liver function tests, TSH
  - Cardiac biomarkers, electrocardiogram (ECG) (for MI or heart failure)
  - Chest radiograph, urinalysis and culture
  - Computed tomography (CT) of the head (look for any structural abnormalities and follow-up with magnetic resonance imaging [MRI] if indicated)
  - Abdominal radiograph or low-dose tomogram (for fecal loading due to constipation)
  - Bladder scan (for urinary retention)



# INSTRUCTOR MATERIALS

## Approach to Geriatric Emergency Medicine

### Small Group Session

#### FACILITATOR GUIDE #2

#### Case 2: “Ms. Lam”

##### Overview

Ms. Lam is an 85-year-old woman who suffered an unwitnessed fall. She has developed delirium and her vital signs are abnormal (particularly given her age and immobility) after a prolonged stay in the ED while awaiting reassessment.

Although she has been in the ED for around 10 hours, she has not had any workup. There is no collateral available from her long-term care home or paramedics. There are few details about her medical history, and it is unknown what medications she is taking. It is not known why she uses a wheelchair. She has had no tests and only a cursory physical examination.

In terms of her management, she has not been fed, offered water, or given her home medications, including her anti-Parkinsonian drug. She has not even been offered acetaminophen for her painful shoulder. She has, however, been catheterized, though it is not clear why.

The point here is that she was handed over as an “open and shut case,” when in fact there is a lot for the oncoming trainee to do – and a lot of opportunity for learning!

##### Sample Objectives

There are almost limitless opportunities in this case to share your own learning points. Here are some specific objectives that the case was designed to address:

- **Even “minor” falls are significant.** This includes low velocity falls from less than standing height:
  - **All falls have causes.** Some of which can be serious, for example, syncopal or presyncopal events can be due to an arrhythmia or hypovolemia. Certain medications and interactions can cause poor coordination and delayed reflexes.
  - **Even minor falls can cause serious harm.** Most notably closed head injuries and rib fractures. Minor injuries such as bruised knees or muscle strains can significantly impair an older adult’s daily functioning, and contribute to functional decline. For instance, even a patient with a splinted wrist sprain who cannot use the railing to climb the stairs safely, prepare meals, or open their medication bottles is not going to fare well at home, and needs more thoughtful discharge planning.
  - **Falls are sentinel events.** They are predictive of subsequent functional decline, hospitalization, and transfer to long-term care. The impact of falls on quality of life is substantial. A survey of older women found that 80% would prefer death to a hip fracture that would result in transfer to long-term care.<sup>17</sup> Falls can also result in fear of falling, which can lead older adults to restrict their activity, leading to deconditioning and social isolation.



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- **Older adults can develop delirium rapidly in the ED.** Up to 25% of functionally independent community-dwelling older adults develop delirium within 12 hours of arriving in the ED.<sup>16</sup> It is important not just to screen patients for delirium, but be vigilant for signs of “ED-acquired delirium.”
- **Pain can cause delirium.** Students likely know the “DIMES” mnemonic (see the Facilitator Guide for Case #1) and will remember that infection, metabolic changes, and head injuries are causes of delirium. However, pain in particular is one very common cause that often goes unnoticed. It is well established that pain in older adults is frequently under-treated, often because of fear that analgesics such as opioids can cause confusion. In fact, untreated pain is more likely to cause delirium than opioids.<sup>16</sup>
- **Older adults experience and report pain differently.** This reinforces the importance of a good primary and secondary survey in even minor older trauma victims. In particular, older adults with chronic and/or acute cognitive impairment, may not report or be able to localize pain.
- **An unattended older patient is an at-risk patient.** If patients are lying on a stretcher unattended for a long period of time, they are probably not being fed, hydrated, or getting their home medications. This includes time-sensitive drugs such as short-acting insulin, inotropes, and anti-Parkinsonian medications. Even missing a dose of an anti-depressant can cause a patient to feel unwell and increase their risk of delirium.
- **Foley catheters can cause delirium.** They can be extremely uncomfortable. They may also provide a nidus for urinary tract infections, which in turn can lead to delirium. A Foley is rarely necessary unless a patient is in urinary retention or has a suspected condition that requires monitoring of urinary output (eg, hypernatremia, sepsis, renal failure). A patient who cannot get out of bed to the commode can be offered continence briefs, while male patients can use less-invasive condom catheters.
- **Delirium risk can be minimized by:**
  - Treating pain.
  - Ensuring patients are fed, hydrated, and get their medications.
  - Avoiding Foley catheters and other unnecessary “tethers.”
- This is also an opportunity to use the example of the first resident’s approach and note to convey some pointers about safe handover, appropriate documentation, and the use of abbreviations (eg, NAD, A&Ox3).

### Discussion Guide

Students’ presentation should be guided by the prompts they were given. Here are some points you can introduce to help provoke critical thinking and discussion.

1. **Why do you think this patient was handed over as an “open and shut case”?**
  - This is an opportunity for students to discuss physician’s attitudes of patient’s needs and how this is communicated to other staff. During handover, Ms. Lam was presented as a patient who required little investigation or attention. Such perceptions could negatively impact patient care and must be carefully avoided in clinical settings.
2. **Are you worried about this patient? Why or why not?**
  - This patient has developed delirium, which can be a sign of serious and even life-threatening illness. At a minimum, it is no longer safe to send this patient home while delirious.



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- She suffered a fall. The first resident concluded it was minor, but the fact that she now has delirium should lead you to suspect that her injuries are more serious. This patient needs a thorough primary survey. Could she have fractured ribs or even a pneumothorax?
  - The cause of her fall has not been identified yet. Perhaps she syncope due to an arrhythmia, hypovolemia from a gastrointestinal bleed, or occult intracranial hemorrhage from another recent fall. Falls are often un-witnessed and the details of the event may be unclear. Therefore, the differential diagnosis and workup for falls in older adults must always include seizures and syncopal events.
  - We also cannot be sure how long she was lying on the floor before she was found. Could she have rhabdomyolysis? Suppose she was lying there overnight and missed multiple doses of her anti-Parkinsonian medication(s)?
3. **What could explain her signs and symptoms?**
- Encourage the students to explore a tailored differential for the patient's delirium. This should include pain and iatrogenic causes, including dehydration and pain.
  - She has probably missed at least one dose of her anti-Parkinsonian medication(s). Missing even a single dose can cause acute exacerbation of symptoms including dystonia, and can even be fatal. In a patient who cannot swallow, essential medications may be crushed and given through a nasogastric tube, bearing in mind that tube insertion can be traumatic and delirigenic.
4. **What do you think about the patient's vital signs?**
- A temperature of 37.9, while technically not a fever, should be considered an elevated temperature in an older adult and suggests he or she is unwell due to infection, inflammation, or intoxication.
  - An oxygen saturation of 92% and elevated respiratory rate in a patient who has been lying completely still in bed and has no known chronic respiratory disease is concerning. This is particularly true in older adults, who have lower baseline metabolic demands. This could be due to a pneumothorax, pulmonary embolus, pneumonia, pulmonary edema, a pleural effusion, an aspiration pneumonitis, or atelectasis secondary to splinted breathing due to pain from a chest injury.
  - Setting aside this patient's delirium, both new fever and tachycardia are inherently concerning, and could suggest any of a wide range of conditions, including sepsis, poorly controlled pain, or alcohol withdrawal.
5. **What do you think about the idea of giving this patient lorazepam and putting her in soft restraints?**
- Sedatives and neuroleptics do not "treat" delirium. Identifying and treating underlying causes is the first and most important step in management.
  - Why do we think this patient needs restraints or medication in the first place? While a colleague's concerns about safety must be taken seriously, the inability to supervise, soothe, or redirect agitated patients who are not an immediate threat to themselves or others is not a reason to sedate a patient.
  - Try the following thought experiment: ask students how they would feel explaining to the patient's family that their loved one was sedated into unconsciousness because no one was available to sit with them, or because no one noticed they were becoming agitated until it was



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too late. It would be unconscionable to sedate every loud, angry, tearful or confused person in the ED, and a confused older adult is no exception.

- How do we know which, if any, drug to give this patient? We are not sure what medications the patient is taking, we have no detail about the patient's obscure "heart problem" (which could be a prior episode of torsades de pointes due to congenital prolonged QT syndrome), and we do not even have an ECG or basic bloodwork.
  - Physical restraints are dangerous. Particularly in a frail older adult, wrenching violently against a restraint could cause serious harm. Any patient could become entangled in restraints and strangulate. Moreover, restraints often exacerbate agitation by causing fear, discomfort, and humiliation.
  - If it is necessary to give medication to an agitated patient, the goal is safety, not sedation. Start low and go slow, administering just enough medication to ensure that the patient cannot harm him or herself — not to induce docility, silence, or sleep. In cases where medical investigations are required for patient wellbeing, a certain degree of sedation or anxiolysis may be appropriate for comfort and/or safety.
  - Haloperidol is the preferred medication to administer in an emergency involving a dangerously agitated older adult with delirium.
6. **With the benefit of hindsight, if you were the first resident, what might you have done differently?**
- This is an opportunity for the students to consolidate and describe (in their own words) an approach to assessment and management that may incorporate the learning points discussed above.
7. **Ms. Lam arrived to the ED alone and experienced a long wait before she received care. What supports exist for geriatric patients in the ED? Are there any gaps in our current practices?**
- This is an opportunity for the students to identify supports for geriatric patients in the ED. Supports may include social workers and other allied healthcare professionals who provide collaborate care. Students may also identify community resources, such as transportation services that assist patients on discharge. In addition, students may identify gaps in current practices such as lack of resources in certain geographic regions that further exacerbate wait times. Students may also identify lack of social supports that lead to social isolation among many older adults.

### Additional Case Answer References:

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# INSTRUCTOR MATERIALS