The Domain Management Model—A Tool for Teaching and Management of Older Adults in Emergency Departments

Hilary Siebens, MD

Abstract

Older adults in emergency departments (EDs) can have complicated health problems that defy straightforward diagnosis and management. Implementation of the 11 core principles in the geriatric emergency care model requires changes in care processes. The Domain Management Model (DMM) is one solution to organize care efficiently using a standard language. Its use is consistent with the geriatric model. Patients' problems are organized into one of four domains: I. Medical/Surgical Issues; II. Mental Status/ Emotions/Coping; III. Physical Function; and IV. Living Environment (A. Physical, B. Social, and C. Financial). Specific geriatric cases illustrate improved communication using these standard domains. This model can educate health care staff, facilitate team care, improve flow of relevant information, improve decision making, and facilitate more meaningful interactions with patients. Key words: elders; geriatrics; Domain Management Model; communication.


Geriatric emergency medicine encompasses many special challenges in the care of older adults.1 Older patients, who account for 15% of emergency department (ED) visits, frequently have complicated health problems that defy straightforward diagnosis and management.2 Emergency physicians themselves acknowledge that the management of older adults is both more time-consuming and more difficult, and requires more resources than the management of younger people.3 On the other hand, emergency physicians have commented that helping older patients can be rewarding. Many of these patients have survived, impressively, the Depression and World War II. They built much of the life and standard of living we have enjoyed. Helping them at this point in their lives is gratifying.

Four cases exemplify the complexities of situations in which older patients require ED care:

1. TL is an 82-year-old woman who fell at home and lives alone. She was getting up from a sitting position after watching television and started walking, felt unsteady, and fell on the rug. She was able to get up but was feeling pain in her knee, became worried, and called the ambulance. She takes medication for hypertension. How can she be evaluated and managed quickly?

2. LP, a 79-year-old woman living at home with her husband, arrives via ambulance in the ED with an oxygen saturation of 45%. She is mildly short of breath with a respiratory rate of 24 breaths/min. She is awake but cannot answer questions or follow directions. She has plantar flexion contractures in both ankles. Chest radiography reveals bilateral lower lobe pneumonias. She hasn’t seen her primary care doctor in nine months. Her husband and daughter are in the ED waiting room. What should her treatment be?

3. WF is a 78-year-old man with a stage III sacral decubitus ulcer and advanced Pick’s disease dementia who was brought from home to the ED. His neurologist, who had not seen the patient in many months, made a home visit and recommended the ED transfer to the family. The patient had a high fever, was minimally responsive, and was not in visible pain. In the ED, his glucose level is 850 mg/dl and his body temperature is 101°F. What should the emergency physician do?

4. MH is an 84-year-old woman who fell wandering alone at 4 AM in the city’s streets. She had moderate dementia, had been independent in self-care and home mobility, but could not prepare meals or manage any of her money. On assessment in the ED, no new medical or surgical problems are found. Should she be admitted?

The first patient, after complete assessment, was safely sent home. In the second case, admission to a medical unit was required. In the third case, the patient was sent home, and in the fourth case, the
patient was admitted. Patients such as these cannot be managed through the usual ED approach in which providers can focus on a single medical complaint or concern. The geriatric emergency care model is required.4

The geriatric emergency care model is the culmination of a five-year effort by the Geriatric Emergency Medicine Task Force of the Society for Academic Emergency Medicine. Eleven core principles identified the essential components (Table 1). Several of these principles apply to good medical care of older adults in all care settings. Examples include: “4. Polypharmacy is common and may be a factor in presentation, diagnosis, and management” and “10. Health problems must be evaluated for associated psychosocial adjustment.” Two challenges include, first, how to implement these 11 concepts into standard care processes and, second, how to enlist the help of referring physicians and referring care settings.

One solution is to use a standard, efficient clinical approach and language. A recently developed model, the Domain Management Model (DMM), organizes care of patients in outpatient offices, acute hospital settings, inpatient rehabilitation hospitals, and skilled nursing facilities.5 The model applies equally well to care in EDs. Its use is entirely consistent with the 11 principles of care and includes routine considerations of mental status and function, two topics of special concern in elders.6 The model is a teaching, communication, and management tool that provides a standard approach and language and introduces efficiency and economy into the entire care process. It can: 1) easily educate physicians and staff about assessment and management of older adults and other patients; 2) efficiently improve the flow of relevant patient information within EDs and between sites of care, saving time and money; 3) help ED staff make better care decisions because staff have more relevant information; and 4) enable ED staff to have more meaningful interactions with patients because they have important information about the context of the patient’s current medical problem.

**THE DOMAIN MANAGEMENT MODEL**

The DMM facilitates practical applications of the biopsychosocial model described first by Engel.7 In that conceptual model, progressively complex levels of information contribute to the health, or ill health, of individual patients: organ-level function, whole-person-level function, and the social world around a patient. The DMM translates Engel’s model into the care of any patient, of any age, with any disease or disability. The two organizing constructs include 1) the domain classification of a patient’s problems and 2) time (Figure 1).5 The domains organize patient problems into four categories to facilitate logical prioritization of issues. Patients’ clinical problems can have biological, psychological, or environmental (social) etiologies and consequences. These problems may or may not affect physical function.

**I. Medical/Surgical Issues.** Domain I encompasses the problems generally considered to be part of the biomedical model. These are diseases that affect organ systems. Included are syndromes—“the aggregate of signs and symptoms associated with any morbid process.”8 Syndromes, such as incontinence, can have multiple different disease etiologies. Sometimes patients’ presenting problems, such as constipation or an uncomplicated urinary tract infection, involve only Domain I, with no other problems in Domains II, III, and IV.

**II. Mental Status, Emotions, and Coping.** Domain II covers the functioning of the brain and mind. An initial component includes communication with a patient. Are vision and hearing adequate? Can the patient comprehend what is being said? If not, why not? Once a method of communication is established, further assessment includes mental status or cognitive function—attention, memory, and executive function or complex problem solving. For instance, in EDs, patients with mild traumatic brain injury may be ambulatory and grossly show no obvious cognitive problems, but probing uncovers cognitive deficits that will significantly affect their daily lives. Up to one third of elder ED patients may have an unrecognized, moderate cognitive defi-
The Domain Management Model

**Clinical Problems**
- Medical/Surgical Issues
  - A. Diseases
  - B. Syndromes

**II. Mental Status/Emotions/Coping**
- A. Cognition
- B. Emotions
- C. Coping
- D. Spiritual

**III. Physical Function**
- A. Basic Activities of Daily Living (BADLs)
  - Home Mobility
  - Self-Care
- B. Intermediate Activities of Daily Living (IADLs)
  - Community Mobility
  - Other
- C. Advanced Activities of Daily Living (AADLs)
  - Vocational

**IV. Living Environment**
- A. Physical
- B. Social
- C. Financial

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*Fig. 1. Overview of the Domain Management Model. Reprinted with permission from the Joint Commission Journal on Quality Improvement.*

Delirium is frequently missed and requires routine processes for quick screening and evaluation. Emotions, primarily depression and anxiety disorders, can manifest as somatic symptoms such as chest pain or can be common comorbidities in patients with other illnesses. Depression is also frequently missed in ED care. Routine clinical suspicion for these emotional disorders is necessary. Coping, "to confront a challenge, conflict, or anxiety with intent to resolve," represents patients' ways of behaving when they deal with medical problems. Coping can be healthy (seeking information, asking for help, etc.) or unhealthy (rejecting all help, extreme anger at medical personnel, etc.). Spirituality is another aspect of Domain II. It reflects critically important personal beliefs that contribute to patients' ideas about their illness and provides a potential source of inner strength and hope. Advance directives, when relevant, are a component of Domain II because they reflect patients' thoughts and preferences. If patients are unable to make decisions, the healthcare team must rely on designated healthcare proxies or seek appropriate people to help with decisions (guardians, etc.). In preparing for patients' eventual death, medical decisions depend heavily on knowing patients' wishes. Finally, the difficult behaviors seen in traumatic brain injury or advanced dementia can be listed as problems in Domain II.

**III. Physical Function.** The level of performance in Domain III depends on issues in Domains I and II. All of us must be able to do certain tasks to survive. The simplest activities are basic activities of daily living (BADLs), such as home mobility and self-care. Intermediate (or instrumental) ADLs (IADLs), such as shopping, managing money, and taking medications, are more complex activities. Advanced ADLs (AADLs) include social roles, such as being a grandparent, pursuing hobbies, and maintaining employment, and represent the most complex activities. Patients' functional deficits, either acute from new illness or chronic, must be understood in determining appropriate medical care. For example, patients' level of function is critical to deciding whether they can be sent home from EDs when they live alone.

**IV. Living Environment.** While the first three domains focus on characteristics of the individual patient, Domain IV focuses attention on the patients' surroundings. The three practical components of anyone's environment include A) Physical, B) Social, and C) Financial. The physical environment includes type of housing, stairs, and interior arrangements of furniture as well as the surrounding community. When disability occurs, modifications in the physical environment can be extremely helpful. In one survey of seniors in EDs, 49% had hazards in their home environments. The social environment encompasses many levels of social interactions, including intimate, friendship, and community relationships. Whether these relationships exist and whether they are positive or negative can be critical to the success or failure of medical interventions that require the help or emotional support of other people. The presence of pets can be another important source of companionship. The third practical component is financial and other community resources. These resources will provide needed care and, if lacking, must be supplemented if at all possible. Planning for power of attorney and guardianship for financial management may be critical for patients with impaired cognition or in people with terminal illnesses.
DMM APPLICATIONS

There are numerous applications for the DMM. In Geriatrics at Your Fingertips, a comprehensive pocket guide for geriatric care, ten dimensions of assessment in the 2001 edition were reorganized using the DMM for easier understanding and learning in the 2002 edition (Figure 2).14,15 The DMM format can organize physiatry consultations in acute care hospitals, outpatient office notes, and discharge summaries from rehabilitation units and acute care hospitals.16,17 When used in formal medical documentation, the DMM expands the standardized problem-oriented medical record system developed by Weed in 1969.18 In another application, the DMM format can summarize teaching case discussions such as the excellent online ones that have been developed for ED care of seniors.19 In all the cases, the four domains are addressed, to a greater or lesser extent, depending on the presenting health problem.

Efficient Communication and Decision Making about Patients. Another important application for the DMM is to facilitate team care. In most cases, no one health care provider can collect all the information necessary for patients who have problems in multiple domains. Using the DMM facilitates efficient teamwork and communication. The domain headings can guide the order of interdisciplinary discussions—either for short, brief discussions in EDs or on acute hospital units or during longer, structured team conferences in inpatient settings such as rehabilitation hospitals or skilled nursing facilities.20 In EDs, teamwork is required in innovative models of geriatric emergency care and through collaborative relationships among ED workers, geriatricians, and primary care physicians (PCPs).4,21

The DMM format can organize the information gathered by different personnel leading to real-time efficiencies in team communication. For example, paramedic report forms can be easily reorganized.4,22

In the second case above, as the patient arrives in the ED, the paramedics’ initial verbal report can include what is routinely recorded in a structured, more comprehensive DMM format (Table 2). The report, organized by domains includes:

I. Medical/Surgical Issues. Vital signs OK but hypoxic on room air; patient found lying in her bed; medication bottles brought to ED (husband got them all from bathroom); the husband reported her breathing difficulty had started the night before with some coughing, no phlegm. There was no observable pain when she was moved to the stretcher.

II. Mental Status/Emotions/Coping. Patient not talking, not following directions, but no resistive behaviors in moving her to stretcher. According to the husband this was no major change in her. Neither the patient nor husband had ever talked with anyone about using a breathing machine if needed.

III. Physical Function. Husband reported he lifted the patient from bed to commode for toileting. During the day she sat in wheelchair and watched TV. She hadn’t walked in three years.

IV. Living Environment. The apartment was very small, some slightly broken furniture but fairly clean, no odor, no obvious alcohol around. A daughter was bringing the husband to the emergency department.

TABLE 2. Summary of Initial Clinical Situation on Emergency Department (ED) Presentation of LP, Case 2*  

<table>
<thead>
<tr>
<th>Domain</th>
<th>Dimension</th>
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<tbody>
<tr>
<td>Medical</td>
<td>Medical status</td>
</tr>
<tr>
<td>Medications</td>
<td>Medications</td>
</tr>
<tr>
<td>Cognitive status</td>
<td>Nutrition</td>
</tr>
<tr>
<td>Functional status</td>
<td>Dentition</td>
</tr>
<tr>
<td>Social, financial status</td>
<td>Mental, emotional</td>
</tr>
<tr>
<td>Emotional status</td>
<td>Cognitive status</td>
</tr>
<tr>
<td>Balance and gait</td>
<td>Emotional status</td>
</tr>
<tr>
<td>Nutrition, Dentition</td>
<td>Physical Function</td>
</tr>
<tr>
<td>Environmental hazards</td>
<td>Functional status</td>
</tr>
<tr>
<td></td>
<td>Balance and gait</td>
</tr>
<tr>
<td></td>
<td>Environmental</td>
</tr>
</tbody>
</table>

*Refer to text for the details of the case.
†Domain category is in italic type. ADLs = activities of daily living.

*Figure 2. Organization of the 200115 and 200216 editions of Geriatrics at Your Fingertips. Reproduced with permission from the American Geriatrics Society.
With this history from the paramedic report, the physician quickly examined the patient, confirming she was awake but not talking or following verbal commands. There was slight respiratory distress and poor color when the oxygen was taken off. Extremity examination revealed bilateral knee flexion contractures as well as plantar flexion deformities in both ankles. Neither foot could be passively moved up to a 90-degree angle with the leg, yet there was no spasticity of muscles pulling the feet into their downward pointing position. Chest radiography revealed major bilateral infiltrates consistent with aspiration pneumonia. Given the patient’s severe cognitive and physical deficits (the contractures indicated she had not walked in a long time), the physician asked to have the patient’s daughter and husband meet him in the conference room. The emergency physician also paged the covering PCP, who was unfamiliar with the specific case, but concurred that more information from the family was necessary to determine the treatment plan and deferred to the emergency physician to manage based on the discussion with the family. Both physicians agreed that it seemed as if this might be the patient’s terminal illness.

In the family meeting, the physician described her serious condition and asked how things had been going at home. The daughter described how the last three years had involved significant suffering by her mother as her dementia had progressed. It had gotten so hard to get her in and out of the car that they had not been able to make the last physician appointment six months prior. And since she was doing all right, they simply were continuing her usual care. The husband sat quietly, saying nothing. The daughter then added that her father, 82 years old himself, was getting very tired of the 24-hour care he was providing. The physician asked the husband whether this was correct, and he nodded, yes. The doctor asked when the patient had last been able to speak, and the husband replied that she had not spoken much over the past 12 months.

The physician mentioned that, given the patient’s severe physical decline and known dementia, there could be choices about whether to use antibiotics to treat the pneumonia or whether to focus on keeping her comfortable and have her potentially die, comfortably, from this severe pneumonia. The daughter and husband looked at each other. The daughter asked whether they could have a day or so to think about this. The patient was therefore admitted, receiving intravenous antibiotics, but with the understanding that she would not be intubated if her breathing got much worse.

The next day, in the hospital, the same covering PCP visited the patient during rounds. A 100% rebreather mask was required to keep the patient’s oxygen saturation at 89%. The PCP contacted her practice’s social worker and a family conference was set up for later that afternoon. In a 30-minute meeting, the geriatrician, social worker, daughter, and husband agreed to stop the administration of antibiotics and put the patient on hospice care. While both the daughter and the husband cried, they verbalized relief that the patient would not be suffering any more. The patient died the next day, with the family at the bedside.

In this case, the initial seriousness of the patient’s condition was discussed by the emergency physician and laid the groundwork for the family to think about the best course to follow and to emotionally prepare for her death. Contributing to consideration of a palliative approach was the knowledge of the patient’s inexcusable functional decline from the family and the extent of caregiver burden on an elder husband. By the next day, with a second discussion, decisions could be made and the patient, and family, experienced a “good” death. Good hospital teamwork, through integrating information from all four domains, facilitated compassionate, comprehensive care.

**Analysis of Cases for Improving Care and Reduction of ED Visits.** In a complicated case such as WF, the third case above, the DMM format can summarize the clinical information in an “executive summary” format. This summary communicates, in real time, from the PCP to the ED both the context and the recent course of a patient’s illness prior to evaluation in the ED. However, an additional function of the executive summary is to provide a structure for overall case reviews when assessing whether care could have been better. For example, the executive summary of WF’s situation, before he was sent to the ED, included:

**I. Medical/Surgical Issues.** Decubitus ulcer from progressive, irreversible immobility, known diabetes.

**II. Mental Status.** End-stage dementia requiring 24-hour care; wife health care proxy; she had agreed with PCP for no further resuscitation (DNR), no further hospitalizations (DNH); the focus of care was to be comfort care at home.

**III. Physical Function.** No longer ambulatory, dependent in ADLs.

**IV. Living Environment.** Living in his own home with hospital bed; daughter, a lawyer, caring and supportive to mother and father.

Given this information, the ED staff could proceed with evaluation and management similar to case 2 above.

Additional analysis of this case suggests ways in which care could have been better and resources used more efficiently. When the neurologist visited WF in his home, the daughter was present and extremely
upset about her father’s condition. The neurologist was understandably alarmed by the patient’s poor condition and recommended the ED transfer. However, the neurologist had perhaps forgotten that the PCP had assumed all care from a prior discussion in which she agreed that the patient’s neurologic condition was end-stage. She was unaware of the PCP’s management over the last several months. After the ambulance was called and the PCP was notified by the patient’s wife, the PCP paged the neurologist and explained the current philosophy of care. The neurologist then agreed to a comfort-care-only approach. The PCP phoned the ED and alerted the staff to the patient’s clinical situation and that comfort care was the goal.

The emergency physician paged the PCP after the patient arrived in the ED. The PCP went to the ED and briefly examined the patient, who was unresponsive and not in visible pain. After brief discussion with the emergency physician, further treatment decisions were put on hold until the PCP spoke with the family. Over the next 45 minutes, the PCP, wife, and daughter discussed the difficult situation. The wife was calm and understood the patient was dying. The daughter, initially tearful, came to understand that no further medical treatment would benefit her father. She phoned her brother, explained the situation, and he, too, over the phone, agreed to the plan to send their father home with comfort care. The patient was sent home with ongoing home health care and died comfortably a few days later.

The case demonstrates the difficult situations confronted by ED staff. The ED team resolved the case appropriately, compensating for earlier decision making that was based on incomplete information. This visit could have been avoided altogether had the neurologist first referred to a problem list organized by domains that included advance directives and the DNH status. In health care, performance improvement must eliminate workload and wasted resources.23

Table 3: Domain Management Model Application to the Identification of Seniors at Risk (ISAR) Questionnaire25

<table>
<thead>
<tr>
<th>I. Medical</th>
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<tbody>
<tr>
<td>6. Do you take more than three different medications every day?</td>
</tr>
<tr>
<td>3. Have you been hospitalized for one or more nights in the past six months?</td>
</tr>
<tr>
<td>II. Mental Status (communication)</td>
</tr>
<tr>
<td>4. In general, do you see well?</td>
</tr>
<tr>
<td>5. In general, do you have serious problems with your memory?</td>
</tr>
<tr>
<td>III. Physical Function</td>
</tr>
<tr>
<td>1. Before the illness or injury, did you need someone to help you on a regular basis?</td>
</tr>
<tr>
<td>2. Since the illness or injury, have you needed more help than usual to take care of yourself?</td>
</tr>
</tbody>
</table>

Increased risk of adverse health and functional outcomes during the six months after the ED visit. It also has helped identify patients who return to the ED within 30 days of a first visit or return three times within six months.25 The Triage Risk Screening Tool (TRST) predicts repeat ED visits, hospitalizations, and skilled nursing facility admissions.26 Five items are included, four of which cover the first three domains (Table 4). The fifth item is a registered nurse’s professional recommendation. This global assessment of risk by the nurse reflects “ED nurse concern for elder abuse/neglect, substance abuse, medication noncompliance, problems meeting instrumental activities of daily living, or other.” Interestingly, the “lives alone or no available caregiver” item was removed from the final model. It presumably did not add to risk prediction after all the other variables were included.

Teaching the components of these screening tools by domain headings may help providers remember the tools more easily—placing the two items in each of the three logical domain categories as in Tables 3 and 4. The conscious mind is not able to deal with large numbers of concrete details.27 Also, psychological research suggests the human mind can keep track of these details, but only if the mind is not interrupted by other processes or distractions.28

Table 4: Application of the Domain Management Model to the Triage Risk Screening Tool (TRST)27

<table>
<thead>
<tr>
<th>I. Medical/Surgical Issues</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Five or more medications</td>
</tr>
<tr>
<td>2. Emergency department use in previous 30 days or hospitalization in previous 90 days</td>
</tr>
<tr>
<td>II. Mental Status</td>
</tr>
<tr>
<td>3. History or evidence of cognitive impairment (poor recall or not oriented)</td>
</tr>
<tr>
<td>III. Physical Function</td>
</tr>
<tr>
<td>4. Difficulty walking/transferring or recent falls</td>
</tr>
<tr>
<td>Other</td>
</tr>
<tr>
<td>5. RN professional recommendation*</td>
</tr>
</tbody>
</table>

*Emergency department registered nurse (RN) concern for elder abuse/neglect, substance abuse, medication noncompliance, problems meeting instrumental activities of daily living, or other.

STUDIES OF AT-RISK SENIORS IN EDs

Others have recognized the importance of evaluating seniors comprehensively in EDs. Current screening tools require explicit information in the first three domains. For example, the Identification of Seniors at Risk (ISAR) questionnaire has six items equally distributed in Domains I, II, and III (Table 3).24 This tool has successfully identified older ED patients at
of only three to seven ideas simultaneously when trying to solve problems. Simplification of lists into subcategories is required for effective and efficient problem solving.

EMERGENCY PHYSICIAN QUESTIONNAIRE ON THE DMM

The Geriatric Special Interest Group of the Society for Academic Emergency Medicine (16 members) listened to a presentation on this model covering the material described above. After the discussion, 88% (SD ± 0.34) of the respondents said they believed their patient management decisions would be helped if information were arranged according to the DMM. The DMM helps “make the patient known” to emergency physicians, one component of innovative models of geriatric emergency care.

CONCLUSIONS

The Domain Management Model is a conceptual model that can be used for practical applications of the geriatric emergency care model. It provides a simple structure for efficient yet comprehensive communication about the health care of older adults in all care settings. Results of the model’s use include: 1) better education of residents and ED staff, including paramedic staff, on systematic assessment and management of older patients and other complex patients; 2) if used by PCPs and other physicians, improved flow of information to ED staff and decreased time spent getting information, saving time; 3) allowing ED staff to make better decisions about their patients, leading to better-quality care and a more efficient use of ED resources; and 4) enabling emergency physicians, equipped with information from all four domains, to have more meaningful interactions with patients and families, especially when difficult choices are necessary in the absence of on-site PCPs or others who know the patients well. Finally, systematic use of the model in reviewing complicated cases by an interdisciplinary team of ED staff and related services may help clarify approaches to prevent ED use and to improve care of older adults.

References

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