Development of a Conceptual Model for Management of Acute, Unscheduled Care in the United States

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About This Report

This report was sponsored by the U.S. Department of Health and Human Services (Office of the Secretary, Assistant Secretary of Preparedness and Response, Division of Health System Policy, Emergency Care Coordination Center (ECCC)) solicitation 14-100-SOL-00012. It is based on a comprehensive review of science and practice literature, online focus groups with different stakeholder perspectives, a concept mapping analysis, a panel of experts in the acute care system, and comments from the public. The report draws from these sources of information to develop a conceptual model for the management of acute, unscheduled care that integrates the emergency care system into the broader healthcare delivery system. The report also includes recommendations on where stakeholders can positively impact the acute care system to transform the current system of care to a more patient and community-centered system.

The conceptual model is intended to address many issues facing the acute care system, from disaster and public health emergencies to day-to-day issues that challenge patients, providers, administrators, and payers. The management of acute illnesses, injuries, and exacerbations of chronic conditions is multifaceted and involves many stakeholders across the entire healthcare system. The conceptual model draws heavily from information gathered from these stakeholders. We thank all of the study participants for their time and effort in reviewing drafts of the models and their contributions to the research. Without the participation of patients, providers, policymakers and payers, we would not have had the unique insights from those most directly impacted by the acute care system to inform the model. We thank Mary Kane and her team at Concept Systems, Inc. for their guidance and expertise on the concept mapping analysis and software. We would also like to thank the Project Officers at HHS/OS/ASPR/DHSP/ECCC and Director of the ECCC, Dr. Brendan Carr, for their review of materials and guidance in this project; however, the material contained in this report is the sole responsibility of the research team and does not necessary reflect the beliefs or opinions of the Project Officers, HHS/OS/ASPR/DHSP/ECCC, or the federal government.

The research was conducted by the Office for Clinical Practice Innovation at George Washington University, an office within the School of Medicine and Health Sciences. Comments or inquiries about this report should be sent to the lead author, Dr. Jesse Pines, at pinesj@gwu.edu or to his address: 2100 Pennsylvania Ave, NW, Room 314, Washington, DC 20037.

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Executive Summary

In this project, we present a conceptual model of an episode of acute, unscheduled care in the United States. Acute medical care is delivered in settings such as, but not limited to, emergency departments, urgent care centers, doctors' offices, and through telemedicine. The model describes how people get acute care and the results of care delivery. It begins with the social and individual determinants of health that influence the likelihood of acute illness and injury, then describes care-seeking decisions, care delivery settings, transitions in care, and how quality care leads to differences in clinical outcomes and costs. We also identify opportunities for acute care stakeholders (e.g., patients, providers, payers , and policymakers) to positively influence the acute care system and care delivery. These opportunities are framed in the context of ongoing federal activities, including provisions of the Affordable Care Act (ACA) and Medicare Access and CHIP Reauthorization Act (MACRA), specifically how programs such as the Merit-based Incentive Payment System (MIPS), Alternative Payment Models (APMs), and physician-focused payment model (PFPMs) may be used to implement some of the recommendations.

At the beginning of the project, we conducted a comprehensive environmental scan of acute care utilization literature. We then sought stakeholder perceptions of the acute care system through online focus groups and two technical expert panels. Perceptions were analyzed through naturalistic research techniques including concept mapping and thematic coding. From the analyses, we created a conceptual model of an episode of acute, unscheduled care. An episode describes the trajectory of an acute illness, injury, or exacerbation of a chronic condition to recovery or death. Because many patients do not completely recover after an episode, they often require longitudinal care for ongoing management of chronic conditions.

We also provide recommendations about how each stakeholder group can reduce the demand for acute, unscheduled care, and, when care is needed, positively influence quality of care and outcomes and potentially reduce healthcare costs. The recommendations include several examples of successful programs and how federal programs may be leveraged to improve the acute care system.

Recommendations for Patients, Families, and Communities

Patients, families, and communities are important partners in ensuring that people engage in healthy behaviors, actively manage medical conditions, and engage with the medical system to ensure that care plans are effective and that transitions in care are seamless.

1. Engage in wellness behaviors and manage chronic conditions to reduce the incidence of acute illness and injury.
2. Improve health literacy to better understand how to manage acute and chronic medical problems, to share in medical decision-making with providers, and to understand recommendations.
3. Actively engage in understanding the healthcare system to efficiently and effectively utilize healthcare services.
4. Work to improve information quality and flow to ensure that patient records are available for doctors, especially in an era where there is not full interoperability of health information technology and electronic medical records.

Recommendations for Individual and Institutional Providers

Individual and institutional providers can work to reduce the demand for acute care by addressing social and environmental determinants by creating programs that prevent acute illness and injury, creating patient-centered ways to communicate during and after an illness, and educating patients on prevention, illness management and health system use.

1. Practice evidence-based prevention by ensuring that patients receive guideline concordant preventive testing.
2. Actively educate and engage patients and families in their health so that patients understand their medical conditions, know how to manage symptoms, and know how to use the medical system when they are experiencing an illness, injury, or acute exacerbation of a chronic condition.
3. Improve access to acute care when patients get sick or injured and guide care-seeking decisions in real time. Providers should create mechanisms for patients to have rapid access to medical care and medical advice about care seeking, even when doctors' offices are not open.
4. Adhere to evidence-based guidelines, work to develop standardized care pathways, and actively coordinate care, with the goal of reducing variation, using best practices, and ensuring that care transitions are effective. The focus should not just be on treating patients for a single visit or hospitalization, but ensuring that the patient is closely and actively managed across an episode of illness or injury, and that care is transitioned to longitudinal care providers seamlessly.
5. Ensure the free flow of health information across healthcare settings. This includes the sharing of health information through information exchanges and working to develop systems that make it easy for providers to access relevant health information at the point of care.
6. Continuously improve care and quality by implementing a culture that promotes data collection, feedback, and close monitoring of quality, and review and improvement of clinical processes.

Recommendations for Policymakers and Payers

The federal government can work to directly address social and environmental determinants of health through the Department of Health and Human Services (HHS) and through partnership with other agencies such as education, housing, and labor, to address factors that lead to acute illness and injury, and acute exacerbations of chronic conditions. The ACA and MACRA have many potential levers that could be used to improve the acute care system after illness and injury occur. Specifically, the federal government can promote programs through MIPS, APMs, and PFPMs to improve access to care, standardize care delivery by assessing quality and outcomes holding both patients and providers accountable, promote effective transitions in care, and ensure that providers have the information they need to make effective and cost-effective decisions. Similarly, payers have many levers to improve access, standardize care, encourage smooth transitions, and increase information flow within and across settings.

1. Enact laws to enhance prevention and reduce disparities, and promote evidence-based prevention as a priority by monitoring and incentivizing high value care.
2. Align incentives for providers to meet patients' acute care needs. This involves developing and implementing regulations and programs that incentivize providers to deliver high quality, high value care to patients and be responsive to patient needs.
3. Align incentives for patients to encourage cost-efficient system use. Policymakers and payers should work to reward patients for prevention and efficient use of healthcare resources.
4. Enhance and expand quality measurement through the development of new performance measures for providers and other stakeholders in the healthcare system.
5. Reward best practices that deliver high-quality, evidence-based care.

The Current State of Acute, Unscheduled Care in the United States

The U.S. acute care system includes a variety of medical settings, including hospital-based emergency departments (ED), acute-care hospitals, urgent care clinics, retail clinics, doctor's offices, freestanding EDs, and telemedicine.[1,2] An essential component of the acute care system is to rapidly treat life-threatening events such as acute myocardial infarction (AMI), trauma, and sepsis.[3,4,5] Treatment of critical conditions require rapid deployment of complex resources.[6,7,8,9] These events are time-sensitive and unscheduled. Therefore, they require extensive emergency care resources to be accessible 24-hours a day. Disaster and public health emergency preparedness and response is also an important component of the acute care system. Communities must be ready to respond to all hazards (natural and man-made), and much of this resiliency is part of the acute care system.

Today, the acute care system must also be responsive to an increasing number of less severe but still urgent conditions that require immediate care, such as most asthma and cellulitis, and to acute injuries that require x-rays and laceration repairs. Treatment for some of these illnesses and injuries can occur outside of acute care hospitals and EDs, for example in doctor's offices, urgent care centers, retail clinics, and in the community with appropriate resources and expertise. However, because illness and injury occur 24-hours, seven days a week, and many setting require appointments, many patients seek care in convenient settings that are available when they are ill or are injured.[10,11,12]

The ability to treat patients with acute exacerbations of chronic conditions is another critically important service the acute care system provides. Over half the U.S. adult population is diagnosed with at least one chronic health condition and one in four adults have two or more.[13] While the acute care system is designed to handle emergencies, improving the value of the acute care system and healthcare system as a whole will require increased emphasis on ensuring a close connection between episodic and outpatient settings to effectively manage a population with a high burden of chronic conditions.

Many aspects of the acute care system are patient-centered. For example, some health systems use call centers to assist patients seeking care for acute, unscheduled conditions.[14,15] EDs provide complex services 24-7 without appointments and treat all patients regardless of one's ability to pay. Regional poison control centers provide toxicology advice via a 24-hour hotline, offering a cost-effective triage mechanism for ED and hospital treatment, and also provide expert advice to ED physicians for poisoned patients.[16,17] Many physician practices are transforming into patient-centered medical homes (PCMH) to provide primary care that is patient-centered, comprehensive, coordinated, accessible, and focused on

quality and safety.[18] Incentives in the Affordable Care Act (ACA) that promote PCMH transformations are intended to improve access and be more responsive to patient needs in outpatient clinics. The ACA created the Center for Medicare and Medicaid Innovation that promote "broad payment and practice reform in primary care, including patient-centered medical home models for high-need applicable individuals, medical homes that address women's unique health care needs, and models that transition primary care practices away from fee-for-service based reimbursement and toward comprehensive payment or salary-based payment."[19] In addition, the acute care system has been dramatically shaped by large growth in urgent care centers, retail clinics, freestanding EDs, and direct-to-consumer telemedicine resulting in changes in perception about availability of care.[2,20,21] However, the impact of this expansion on quality and outcomes has not been extensively researched.

Despite these features, the acute care system today is not meeting the needs of patients in many communities. High costs, poor communication, lack of decision-making support, long waiting times, and uncoordinated health services are common frustrations for patients.[22] The ability of the acute care system to meet patient needs and expectations is also diminished by fragmentation, poor interoperability of health information technology (HIT), and an undersized primary care infrastructure.[23,24,25,26,27] As a result, cost, quality, and access are highly variable within and across communities.[28,29,30] The large number of people with multiple chronic conditions makes finding solutions to these problems necessary to improve the value of the acute care system.

Variation in the acute care system can also be observed in disaster response and preparation. Well-coordinated responses during public health emergencies like the Boston Marathon bombing demonstrate the effectiveness of simulated scenario training and the importance of resource availability.[31,32,33] In contrast, the response after Hurricane Katrina demonstrates the devastating consequences of communication and information failures that can occur before, during, and after disasters.[34,35]

Provisions in the ACA and MACRA of 2015 have created incentives to build a healthcare system that enhances value and overcomes issues of high cost and fragmentation.[36] Specifically, elements of the Merit-based Incentive Payment System (MIPS), Alternative Payment Models (APMs), and physician-focused payment model (PFPMs) can work to shape the acute care delivery system in positive ways, improving its efficiency and improving patient-centeredness. In the Institute of Medicine's 2002 report, *Crossing the Quality Chasm: A New Health System for the 21st Century,* a major focus of redesigning care is to ensure patients are treated safely, effectively, efficiently, in a timely manner, with patient-centered

and equitable care.[37] Motivating patients to be active participants in their care with their providers is central to redesigning the acute care system. Patient-centered care is associated with better outcomes and decreased healthcare utilization.[38,39,40] Solving the issue of interoperability and usability of HIT and improving care coordination across settings will be vital to improving the ability of providers to practice cost-consciously.[41]

Project Objectives and Methods

The overall goal of this project is to build a novel conceptual model of acute, unscheduled care that describes an episode of medical care in the acute care system today. The ultimate goal is to inform how acute care systems can better accommodate patient demands, deliver good value, and be resilient for disasters. Through a common understanding of how the various components of the acute care system work and relate to one another, stakeholders can develop solutions that improve the overall value of the acute care system.

The proposed conceptual model of acute, unscheduled care highlights the features of the acute care system that patients, providers, payers, and policymakers have told us are critical to understanding an acute episode of care. Four specific aims were followed to develop the final conceptual model:

Aim 1: To describe the acute care system today, an environmental scan of the existing literature was conducted using medical and non-medical search engines, cataloged in an online library, and updated periodically with new literature (from 2000-2015).

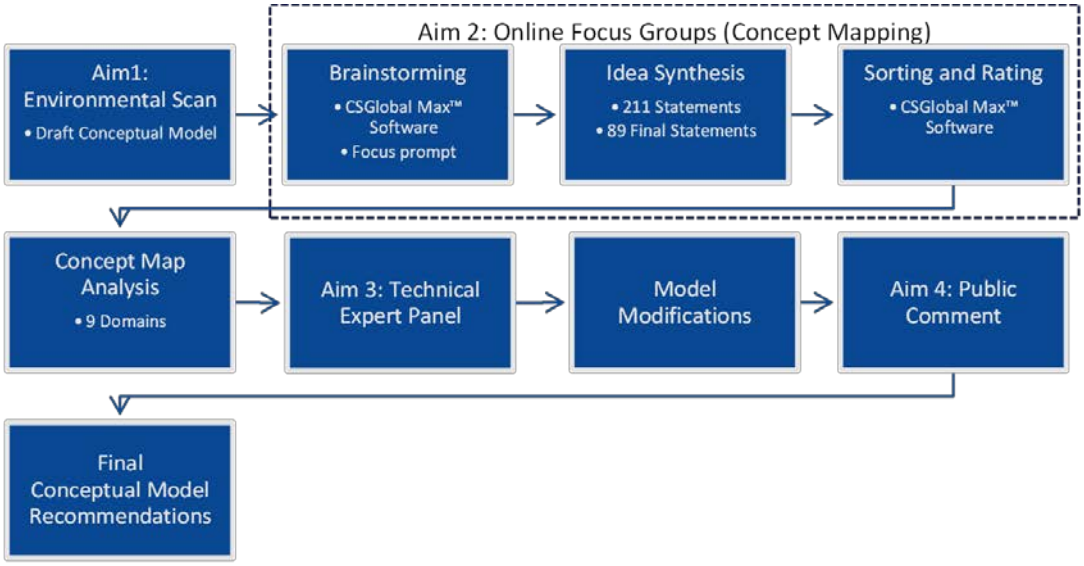
Aim 2: To inform how the acute care system might be built in the future, four online focus groups were conducted with the following stakeholder groups: patients, acute care providers, other healthcare providers, and other stakeholders in the acute care system (e.g., policymakers, payers). Each of the online focus groups participated in a concept mapping activity that produced an output map that could inform the draft conceptual model.

Aim 3: To further refine the model, findings were presented to a technical expert panel. From the environmental scan, online focus groups, and the expert panel, a list of potential recommendations to improve the value of acute care delivery were made.

Aim 4: To receive additional feedback on the model and recommendations, the final step of the project was to seek public comment from Urgent Matters – an online dissemination platform for a

multidisciplinary audience of emergency care stakeholders – and to integrate that feedback into the final report.

Figure 1: Study Flow



Aim 1, environmental scan, produced the draft conceptual model. Aim 2, online focus groups (concept mapping) began with brainstorming. Brainstorming was conducted using CS Global Max software and a focus prompt. Idea Synthesis created 89 final statements from 211 statements generated in brainstorming. Sorting and rating data was analyzed using CS Global Max which produced 9 domains. Aim 3, convened a technical expert panel and made model modifications. Aim 4 included public comment and final conceptual model recommendations.

Aim 1: Environmental Scan

To inform the development of the conceptual model for acute, unscheduled care an environmental scan of the existing literature was conducted. We used search terms that targeted a broad definition of acute, unscheduled care, including acute illness and injuries as well as acute exacerbations of chronic conditions. Asplin's Input-Throughput-Output (I-T-O) conceptual model for emergency department crowding was used as a framework to find literature and information on the acute care system,[42] specifically exploring the acute care literature to assess factors associated with inputs (or care seeking behavior), throughput (variation in acute care approaches, ways to manage acute conditions across settings, specific capabilities and capacities available in specific settings such as EDs, urgent care centers, doctors' offices, and telemedicine), and output (potential pathways for patients after acute care). Additional searches that focused on the acute care needs of vulnerable populations, such as people with mental health and substance use disorders, rural populations, and the homeless were conducted.

Finally, recent policy initiatives, such as resource utilization initiatives, quality measurement, and health information technologies were examined in the context of the acute care system.

To find and organize the environmental scan, we used a scoping review methodology. A scoping review is an approach to reviewing the literature that aims "to map rapidly the key concepts underpinning a research area and the main sources and types of evidence available, and can be undertaken as stand-alone projects in their own right, especially where an area is complex or has not been reviewed comprehensively before." [43 (p. 21)] A scoping review - in contrast to a systematic review - is designed to address broader topics where many different studies designs and approaches of varying quality are relevant. Additionally, scoping reviews can be useful for policy makers, practitioners, and consumers who might otherwise lack time or resources to review the literature themselves and are thus well suited for focus group sessions and expert panels.

1.1 Framework

The methodological framework for a scoping review is separated into five iterative stages: (1) identifying the question; (2) identifying relevant information/literature; (3) selection criteria/search terms; (4) charting the data; and (5) collating, summarizing, and reporting the results.

(1) Identifying the question - The objective of the environmental scan was to answer the question, "What is the current state of how acute illness, injury, and acute exacerbations of chronic conditions are managed in the United States?"

(2) Identifying the relevant information/literature - Information and literature were identified using a peer-reviewed literature search engine (Scopus), lay press (Google News), and manual searches through stakeholder websites. After the initial searches, the study team conducted post-hoc searches to add new information in areas that were not adequately informed by the initial searches.

(3) Selection criteria/search terms - The initial search strategy aimed to identify articles pertaining to acute, unscheduled care in the United States. Most articles selected were from after the year 2000 because these would be most relevant to current delivery practice and utilization patterns. We used several post-hoc searches to generate additional results in areas we felt that the initial search did not adequately address. Searches used Boolean operators (AND/OR) and combinations of the following key search terms: acute care, acute illness, acute exacerbation, acute condition, chronic disease, chronic condition, chronic illness, acute care management, acute care model, frequent users, frequent flyers,

unscheduled, clinic, emergency, urgent, hospitalization, inpatient, admission, readmission, nurse call center, telephone triage, health behavior. Post-hoc searches were added using new key words (e.g., call centers, ED frequent users, regionalization) and references from selected articles. In addition, we conducted searches on a list of 14 authors that have made significant contributions to the field of emergency medicine/acute care.

Scopus (www.scopus.com) was used to search the peer-reviewed literature. Scopus is a subscription-based service that searches articles, reviews, conference papers, and editorials in health sciences and social science literature. PubMed was also used to conduct post-hoc searches.

The initial search resulted in 1,721 articles, reviews, and editorials. Additional post-hoc searches resulted in an additional 801 results. The title and abstracts for each article were reviewed by our study team. Post-hoc google searches were conducted using search terms associated with the key words used as tags. A final selection of 934 articles and news items were selected based on relevance to acute care management in the United States. These articles were saved and catalogued using the online reference manager, Zotero.

(4) Charting the data – Asplin's Input-Throughput-Output (I-T-O) conceptual model for emergency care was used as a framework to chart the articles and information identified. Articles were "tagged" with 1-4 keywords associated with inputs (emergency care, unscheduled urgent care, safety net care), throughput (workforce, crowding, boarding/barriers to admission), and output (admission decisions, care coordination, observation units, palliative care, readmissions). We created additional tabs for specific subpopulations of patients that use the acute care system (e.g., mental health and substance use disorders, rural, homeless) and overarching concepts (e.g., definitions of acute care, health utilization models).

(5) Collating, summarizing, and reporting the results. The data charted in the scoping review was organized into five categories: (1) conceptual models; (2) definitions; (3) the acute care system (using the Input-Throughput-Output framework); (4) vulnerable populations; and (5) policy and innovations. These categories were used to organize the environmental scan (Figure 2).

Conceptual Models

We found several existing models of medical care, some specifically addressing acute care that have been published in the literature (Table 1). The Anderson Behavioral Model of Health Care Utilization was

initially developed in the late 1960's, and proposes that the use of health services is a function of individual and family predisposition to use services, factors that enable or impede use, and specific needs for care.[44] Aday's model from 1974 recognizes the role of health policy in achieving equitable health care access and how that is operationalized into utilization of health care services.[45] In 1995, Andersen's model was updated to emphasize the importance of health outcomes and equity.[46]

Figure 2. Organization of the Environmental Scan

- Frameworks
  - Conceptual Models
    - Health care utilization models
    - Emergency care crowding models (Input-Throughput-Output)
    - Chronic care models
  - Definitions
    - Ambulatory care sensitive conditions
    - Emergency care sensitive conditions
    - ED visit categorizations
- Results
  - The Acute Care System
    - Inputs
    - Throughputs
    - Outputs
  - Vulnerable Populations
    - Mental health and substance use disorders; homelessness; veterans' health issues; pediatrics and geriatrics; rural populations, disabilities
  - Policy and Innovations
    - Resource utilization; quality improvement and measurement; health information technology, telemedicine; patient safety

In emergency care, the most cited conceptual model that specifically addresses the acute care system is the Input-Throughput-Output (I-T-O) model developed by Asplin and colleagues in 2003.[42] The I-T-O model was created in a time when the focus of emergency care research was on identifying the causes, consequences, and solutions for ED crowding. The input component includes emergency care in the ED, unscheduled urgent care, and safety net care. The throughput component of the model identifies internal processes (e.g., triage, evaluation, diagnostic testing, treatments, ED boarding) as contributors to ED crowding. The output component identifies factors outside the ED itself, such as availability of timely follow-up appointments and access barriers experienced by vulnerable populations, as other contributing factors to ED crowding.

Another important model in health care is the Chronic Care Model (CCM) developed by the MacColl Center for Health Care Innovation in 2002.[47] The CCM was developed to organize the literature on promising strategies for chronic illness management and has been tested nationally across varied health care settings. The CCM includes the community, the health system, self-management and support, delivery system design, decision support, and clinical information system as essential elements of high-quality chronic care.

Table 1. Conceptual Models of Medical Care

Lead Author, Year	Major Themes
Andersen, 1968	Predisposing Characteristics → Enabling Characteristics → Need → Use
Aday and Andersen, 1974	Health policy → Characteristics of health delivery system + Characteristics of population at risk → Utilization of health services + Consumer satisfaction
Andersen revisited, 1995	**Environment** (health care system, external environment) → **Population characteristics** (predisposing characteristics, enabling resources, need) → **Health behavior** (personal health practices, use of health services) → **Outcomes** (perceived health status, evaluated health status, consumer satisfaction)
Aday and Awe, 1997	Health policy →Potential Access → Realized Access → Equity →Efficiency / Effectiveness → Health and well-being (Quality of Life)
Asplin, 2003	**Input** (emergency care, unscheduled urgent care, safety net care) → **Throughput** (patient arrives at ED, triage and room placement, diagnostic evaluation and ED treatment, ED boarding of inpatients)→ **Output** (ambulatory care system, transfer, hospital admissions)
The MacColl Center for HealthCare Innovation, 2002	**Community** (resources and policies: self-management support) **+ Health Systems** (organization of health care: delivery system design, decision support, clinical information systems) → **Informed, activated patient + Prepared, proactive team = Improved outcomes.**

Definitions

Although much of the focus on the emergency care system has been in the area of critical illness, most acute care visits are for urgent conditions rather than life-threatening events. The environmental scan found three conceptual definitions of medical care that apply to the acute care system: (1) ambulatory care sensitive conditions; (2) emergency care sensitive conditions, and (3) a framework for categorizing ED visits (Table 2).

In 1993, Billings et al. developed a list of ambulatory care sensitive (ACS) conditions to examine patterns of hospital use in New York City. ACS conditions are defined as conditions where "timely and effective outpatient care can help to reduce the risks of hospitalization by either preventing the onset of an illness or condition, controlling an acute episodic illness or condition, or managing a chronic condition or condition." [48] The ACS conditions are now maintained by the Agency for Healthcare Research and Quality (AHRQ) as the Prevention Quality Indicators. [49] Many of the ACS conditions are acute exacerbations of chronic conditions such as congestive heart failure, chronic obstructive pulmonary disease, asthma, complications from diabetes, and hypertension.

Table 2. Conceptual Definitions of Medical Care

Lead Author, Year	Definition
Billings, 1993	*Ambulatory care sensitive conditions* - Conditions for which good outpatient care can potentially prevent the need for hospitalization, or for which early intervention can prevent complications or more severe disease. Provides insight into unmet primary care needs of a community and variation between communities.
Carr, 2010	*Emergency care sensitive conditions* - Conditions for which rapid diagnosis and early intervention in acute illness or acutely decompensated chronic illness improve patient outcomes. Includes time-critical high-acuity conditions (e.g., major trauma, stroke) and undifferentiated chief complaints (e.g., chest pain).
Smulowitz, 2013	Framework for categorizing ED visits: - Emergencies (trauma, medical, surgical) - Intermediate/complex conditions (complex chronic conditions: congestive heart failure, chronic obstructive pulmonary disease, diabetic complications) - Minor injury/illness (sore throat, cough, sprains, rash)

As an analog to the ACS conditions, Carr et al. proposed development of emergency care sensitive conditions that could be described as "conditions for which rapid diagnosis and early intervention in acute illness or acutely decompensated chronic illness improve patient outcomes." [50] These types of conditions could include time-critical high-acuity conditions (e.g., major trauma, ST-elevation myocardial infarction, acute ischemic stroke, sepsis, cardiac arrest) as well as undifferentiated chief complaints (e.g., chest pain).

To categorize types of ED visits, Smulowitz et al. defined three broad areas of acuity (emergencies, intermediate/complex conditions, minor injury/illness) and identified the intermediate/complex conditions as having the most potential for cost-savings. It is in this category that acute exacerbations of chronic conditions and acute presentations of illness that interventions and policy could have the greatest potential savings.[51]

1.2 Findings

Acute Episodes

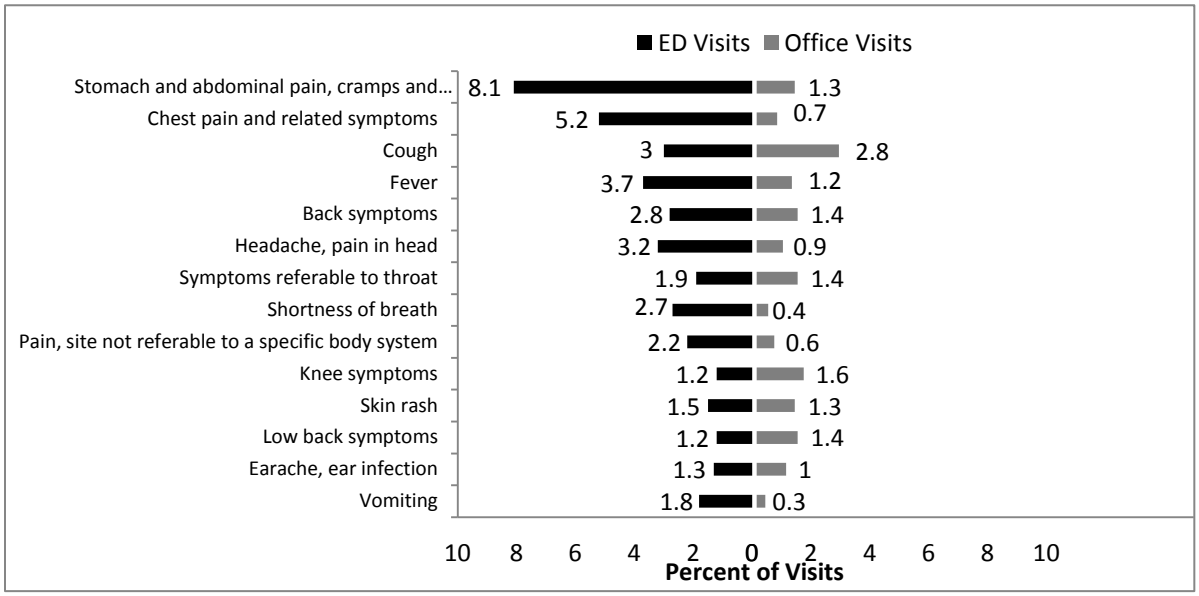
An episode describes the trajectory of an acute event to recovery or death. Acute episodes were categorized into two distinct categories: (1) acute illnesses/injuries; and (2) acute exacerbations of chronic conditions.

Acute Illness/Injuries

There has been considerable attention in the scientific literature over what acute conditions are best treated by the ED and what episodes are best treated in other settings such as the primary care office, community clinic, or, more recently, urgent care and retail clinics. This debate is informed by varying patient,[52,53,54,55] provider,[56,57,58] and policy perspectives.[59]

In both ED and office settings, symptoms of acute illnesses are common reasons for visits to a provider. In the ED, the most common acute illness symptom is stomach and abdominal pain, which make up 8.1% of all ED visits. In the office setting, complaint of cough is the most common, making up 2.8% of all office visits (Figure 3).

Figure 3. Proportion (%) of Visits Treated at Emergency Departments and Office-Based Physicians for Complaints of an Acute Illness



Source: National Ambulatory Medical Care Survey, Public-use Data Files, 2012 and National Hospital Ambulatory Medical Care Survey, Public-use Data Files, 2011.

The most common acute complaints seen at emergency departments (ED) and office-based physicians (OBP) are: stomach and abdominal pain, cramps and spasms (8.1% ED, 1.3% OBP), chest pain and related symptoms (5.2% ED, 0.7% OBP), Cough (3% ED, 2.8% OBP), Fever (3.7% ED, 2.8% OBP), Back spasms (2.8% ED, 1.4% OBP), Headache (3.2% ED, 0.9% OBP), Symptoms referable to throat (1.9% ED, 1.4% OBP), Shortness of breath (2.7% ED, 0.4% OBP), Unspecified pain (2.2% ED, 0.6% OBP), Knee symptoms (1.2% ED, 1.6% OBP), Skin rash (1.5% ED, 1.3% OBP), Low back symptoms (1.2% ED, 1.4% OBP), Earache/ear infection (1.3% ED, 1% OBP), and vomiting (1.8% ED, 0.3% OBP).

Together, these 14 acute symptoms accounted for 54 million ED visits (40%) and 151 million office visits (16.3%). Not represented in these data are visits to other acute care settings that are not staffed by physicians, such as retail clinics. Retail clinics, like physician offices, treat many acute conditions such as upper respiratory infections, pharyngitis, ear infections, conjunctivitis, and urinary tract infections.[60] Retail clinic visits increased four-fold between 2007 and 2009 and now account for almost 6 million annual visits.[61] Between January 2006 and February of 2012, 1,669 retail clinics opened and 502 closed across the U.S. with the majority of that growth occurring between 2006 and 2008.[62]

EMS also plays a significant role in the acute care system by treating and transporting people with acute illnesses to hospital-based emergency departments. Of the 136.3 million ED visits in 2011, 21.3 million (15.7%) arrived by ambulance –an average of 40 per minute. The most common non-injury related complaints arriving by ambulance were for chest pain (8%), stomach and abdominal pain (6%), shortness of breath (5%), convulsions (3%), and back symptoms (3%).[63] Newer models of community paramedicine have also emerged. For example, Houston's ETHAN project uses video-based technology so that

physicians can chat directly with patients and EMS staff for minor 911 calls, and potentially avoid ED visits.[64]

Injuries are one of the most common reasons people enter the acute care system, accounting for 21% of child ED visits, 14% of adult ED visits[65], and 10.1% of all physician office visits. Each year, injuries account for 27 million outpatient emergency department (ED) visits, 2.5 million hospitalizations[66], and 93.6 million office-based physician visits. The acute care system is designed to treat a diverse range of injuries, from cuts requiring a few sutures to major traumatic injuries such as gunshot wounds and motor vehicle crashes that must be quickly transported to a trauma center.

Acute Exacerbations of Chronic Conditions

Approximately half of the U.S. population has been diagnosed with at least one chronic condition.[67,68] The expectation is that this percentage will only grow larger as the population ages. Treatment and management of chronic conditions is a major component of the acute care system. More than 50% of office-based physician visits are with patients with one or more chronic conditions and 14% of visits involve a patient with three or more chronic conditions.[69]

In the ED, 14.3% of visits are with a patient with one or more chronic conditions, with an average age of 60.3 years old. Management of chronic conditions has become a central focus of health systems as acute exacerbation of pediatric asthma, [70,71,72,73] chronic obstructive pulmonary disease [74,75,76,77], and diabetes [78,79,80] often lead to ED visits and hospital admission.[81,82]

Similar to acute episodes of injury and illness, non-ED settings may lack capacity and capabilities to treat acute exacerbations of chronic conditions. Many health systems struggle to find patients same day appointment or provide after-hours primary care that do not conflict with patient's work and/or family responsibilities.[83,84]

The Acute Care System

The acute care system must be responsive to acute illnesses/injuries and acute exacerbations of chronic conditions. Literature about the acute care system was organized according to Asplin's input-throughput-output conceptual model of ED crowding.[42]

Input

The input component of the ITO model includes conditions and system characteristics that contribute to the demand for acute care services: emergency care, unscheduled urgent care, and safety net care. In the Andersen model of health care utilization, patient-level factors (predisposing and enabling factors) influence a person's decisions about when and where to seek acute care.[44] We also searched the literature for alternative settings to the ED that treat unscheduled acute care such as urgent care and retail clinics.

Emergency Care Delivery

There were a variety of articles that have been published on input, or how people seek acute care. For emergency care – specifically for the care of high acuity conditions such as stroke, trauma, and sepsis – articles focused on the need for systems of care to develop time-sensitive and complex care, and the need for regionalization across communities. Several studies examined predictors of who uses emergency care[85,86,87] when emergency care is utilized[88,89,90] and where.[91,92,93] The majority of emergency care falls into cardiac events (e.g. acute myocardial infraction, stroke), injury, or sepsis. The ED is especially well equipped to handle these types of acute care episodes. Trauma centers have been shown to improve survival outcomes of severely injured patients.[94,95,96] Timely treatment of stroke[97,98,99] and sepsis[100,101] is especially important to outcomes.

Delivery of emergency care can be regionalized, particularly for time-critical conditions, and prehospital care facilitates care delivery. Regionalization has been given high prominence in emergency medicine's health policy research agenda but is not tied to current payment incentives.[102] The focus of regionalization is to get the right care to the right patient at the right time.[103] Regionalization of trauma care services,[104] acute care surgery,[105] stroke services,[106] and STEMI services[107] have all been shown to improve patient outcomes. Providing these services for all patients that need them at all times is complicated by workforce shortages, geographic isolation of some patients, and distribution of emergency care providers.

An important component of emergency care delivery is EMS/prehospital care. Articles on prehospital care primarily focused on the delivery of specific treatments – such as organized systems to deliver advanced life support, and the use of specific resources such as helicopter transport in the critically ill patient.[108,109,110] In addition, there were a variety of articles describing factors that influence the use of ambulances, even for patients with minor conditions.[111,112,113] For many acute care episodes, timeliness is a critical component of favorable patient outcomes.[114] EMTs and paramedics are often called to the

scene of an acute care episode to initiate treatment and transport to an ED. Sometimes, it is the patient's primary care provider that begins prehospital management of an acute care episode or acute exacerbation.[115,116]

Disasters have the potential to quickly overwhelm the acute care system and health systems must be prepared to adjust operations to provide care according to the demand and resources available.[117] Events such as Hurricane Katrina in New Orleans in 2005, bombings at the Boston Marathon in 2013, Superstorm Sandy in 2012, and Ebola in Dallas in 2014 have shown that systems must be prepared for a wide range of disasters requiring vastly different responses. Despite a ubiquitous need for communities to be prepared for disasters, the primary payment mechanism for disaster preparedness is through grants, which are particularly vulnerable to budget cuts at the federal, state, and local levels.[118]

Unscheduled Urgent Care

Literature on unscheduled urgent care focuses on conditions that are urgent but not life-threatening and whether/how these conditions may be treated in non-ED settings, such as primary care, retail clinics, and urgent care clinics. This includes management of chronic conditions and has become a central focus of health systems given that acute exacerbations of pediatric asthma,[119,120,121,122] COPD [123,124,125], and diabetes [126,127,128] often lead to ED visits and hospital admission.[129,130] There has been considerable debate over which acute care episodes are best treated by the ED and which episodes are best treated in other settings. This debate is informed by varying patient,[131,132,133,134] provider,[56,135,136] and policy perspectives.[137] The importance of EDs in the management of the seriously ill and injured is well recognized; however, discussion surrounds "appropriateness" of certain conditions for EDs and what should be treated in primary care or urgent care settings.[138] Some authors have written that the treatment of non-serious conditions in the ED is associated with ED crowding[139,140] and unnecessary health care costs[141,142] suggesting that these patients should not be treated in the ED. However, others have found that these types of visits have minimal impact on health care costs,[143,144] that primary care capacity is limited,[145,146] and that patients prefer the ED over other settings.[147,148,149]

ED patients that return to the ED within a few days of treatment are also a focus of the literature. Current estimates are that three percent of all ED visits return with 72 hours.[150] However, more recent evidence suggests that the 72 hour cutoff point may be too short a time period and empirically driven models indicate a nine day time period as a more accurate measure.[151] Studies also vary on how many return visits are preventable and how often they are due to patient, provider, or other factors. Some commonly cited factors that drive revisits are alcohol or opioid dependence, seeking food and shelter,

convenience, psychiatric disorders, limited access to primary and specialty care, lack of private insurance, poor quality discharge instructions, and lack of understanding.[86] Additional perspectives have come from interviewing patients directly. One study found that concerns over the quality of their clinical care received during the first ED visit (e.g., believing more diagnostic tests were needed, not feeling their primary complaint was addressed, dissatisfaction with discharge diagnosis, etc.), belief that their condition was worsening, and concern that the outpatient system would not be responsive to their needs were found to be the most important drivers of revisits within nine days.[152] Another qualitative study examining why Medicaid patients come to the ED for nonurgent conditions (diagnosis of rash without fever, rhinitis or cold symptoms, and cystitis) found that people used the ED because they had been told to do so by staff in their primary care physician's office, had difficulty getting an appointment with a PCP in a timely manner, and believed that the ED would be the fastest way to receive care.[153]

The rise in the number of urgent care and retail clinics has prompted researchers to explore cost,[154,155] quality,[156,157] and patient preferences[158,159] for these alternative settings. A number of ED visits could potentially be managed in these settings but the impact on ED crowding and patient outcomes is not well understood.[160] Whether these settings serve as a pathway for acute care demand or induce new demand is a matter of study.[161] Greater proliferation of retail clinics and urgent care centers may provide viable alternatives for someone without insurance and/or difficulty accessing a primary care provider[162] or may increase care fragmentation and poor outcomes.[163]

Safety Net Care and Disparities

Safety net care and disparities in acute care also yielded several articles, demonstrating the critical role of the acute care system in treating low income and other disadvantaged populations. In addition, there were several articles documenting disparities in acute care delivery by race, ethnicity, region, and socio-economic status, despite legislated access to emergency department care in the U.S. through the Emergency Medical Treatment and Labor Act (EMTALA).[164] Many patients with acute care needs rely on safety net providers. EDs and community clinics have traditionally been the primary providers of acute care for the under and uninsured. Financial instability and closures have reduced access for many patients that rely on these facilities for their health care.[165,166,167,168] Racial and ethnic minorities are disproportionately impacted by disruptions in the health care safety net and have resulted in a number of articles on disparities in access to care.[169,170,171,172] The safety net also provides a significant amount of acute care to vulnerable populations such as the people experiencing homelessness, people living with HIV/AIDs, veterans, people with mental health and substance use disorders, and the prison population.

Throughput

The throughput component of the I-T-O model emphasizes the processes that impact the efficiency and effectiveness of the ED. Triage/room placement and diagnostic testing are the primary phases of throughput. Triage protocols based on clinical presentation are commonly used to determine patient prioritization, but wait times vary by time of day, day of week, and season[173] and have been shown to be influenced by non-clinical patient characteristics such as insurance status, race, and gender.[174,175,176,177] Crowded EDs and long wait times have been shown to have a negative impact on patient outcomes[178,179] and satisfaction.[180,181]

There have been some recent efforts to incorporate patient preferences in the diagnostic testing.[182,183] In cases of serious illness of injury this may be less feasible, but for many acute conditions, patient-provider shared decision making has been promoted as a way to improve quality, lower cost, and increase patient satisfaction.[184]

ED Crowding

Over the past decade, there has been a surge in literature on ED crowding, particularly the relationship between ED crowding and quality of care, along with several articles demonstrating interventions to mitigate crowding, mostly within individual EDs. ED crowding is commonly described as a periodic mismatch of demand and capacity.[185] The number of ED visits in the United States has sharply increased over the last decade and the ability to treat patients quickly and effectively during periods of high demand can become compromised.[186] Research has shown crowding to be caused by a number of internal and external factors and is not simply a problem of an insufficient numbers of EDs, beds, or doctors. ED crowding is a hospital-wide problem requiring system-wide solutions.[187]

The problems of crowded EDs have been well documented for over 20 years.[188] Crowded EDs have been shown to increase medical error, create unnecessary downstream costs, impede access to care, and negatively impact patient satisfaction:

- Experts cite long periods of boarding as a key contributor to ED crowding. Boarding patients (i.e., admitted patients still occupying spaces in the ED) prevents new patients from being treated. Boarded patients tend to be sicker and therefore require more attention of ED staff. Long periods of boarding are associated with poorer patient outcomes, including mortality.[189]
- The Office of the Assistant Secretary for Preparedness and Response has described the impact ED crowding could have in responding to a catastrophic event. When EDs function efficiently on a daily basis, they are more likely to function efficiently during public health emergencies or disasters.[190]

- Long waiting times are associated with a higher percentage of patients that leave the ED without being seen by a provider. [191] Some people who leave required immediate medical attention and return after their condition has deteriorated.[192,193]
- EDs that are overcrowded will sometimes place themselves on "diversion." When a facility is on diversion, ambulances must bypass the ED, which could lead to delays in treatment for seriously ill or injured patients.[194,195]
- When EDs are crowded, some patients may not receive care in accordance with evidence-based guidelines. For example, crowding has been associated with delays in pneumonia patients receiving antibiotics within the recommended four hour window and with worse adherence to guidelines for patients experiencing myocardial infarction.[196,197,198]
- Frequency of medication error is positively correlated with the level of ED crowding.[199]

Acute Care Workforce

We also looked for literature about the acute care workforce that impact efficiency and effectiveness of moving through the system, inside and outside the ED. Several articles were found on the expanded role of non-physician providers, such as nurse practitioners, physician assistants, and pharmacists. There is extensive coverage in the peer-reviewed and lay press on primary care and nursing shortages.[200,201,202] Workforce shortages prevent timely access to primary care physicians for many people seeking acute care.[203] In the coming years, projected demand for primary care is expected to outpace supply.[204,205] In the ED and other settings, increasing the scope of practice for nurses, physician assistants, and technicians has been offered as solutions to the workforce shortage.[206,207,208] Some states have expansive scope of practice laws, but the impact of these laws have made on primary care supply, cost, and outcomes is not clear.[209,210]

ED Boarding and Barriers to Admission

There is a substantial amount of literature on ED boarding, noting the close relationship between ED boarding and lower quality of care, and also ED boarding as a major cause for ED crowding. Boarding of patients in the ED was a focus of the original I-T-O model. Process inefficiencies and capacity issues forces the ED to board patients scheduled for admission until an inpatient bed becomes available.[211] Boarding consumes ED resources that could be used for other patients and has been associated with poor patient outcomes and ambulance diversion.[212,213,214] A recent cross-sectional study of boarding practices in the United States found the national median boarding time to be 79 minutes (IQR 36 to 146 minutes), with higher boarding times associated with higher ED volumes[215] and it appears that average boarding time may be trending down.[216] Proven solutions to ED boarding that utilize existing resources,

such as moving boarders to inpatient hallways, smoothing elective surgical schedules, active bed management, and expediting inpatient discharges may be underutilized.[217]

Output

The output component of the I-T-O model focuses on the movement of patients out of the ED after an ED visit and follow-up care. An ED visit either leads to an admission to a hospital (either acute, long-term, or rehab) or discharge. Patients may wait several hours in the ED before admission to the hospital, a practice referred to in the literature as "boarding." More hospitals are utilizing observations units to monitor patients after an ED visit without formally admitting them to the hospital. For people with advanced chronic conditions, palliative care units are another option that can provide symptom relief without intensive intervention. Care coordination after hospital admission, ED discharge, or visit with another provider tries to align many different providers and supports for a patient. Care coordination and discharge planning can help reduce avoidable hospitalizations and rehospitalizations.

Admission Decisions

The literature on admission decisions focuses on variations in decision making, and the use of clinical decision rules as a potential solution to safely reduce admission rates and variation. It has been suggested that admission decisions in the ED are one of the single most costly decision made on a daily basis.[218] Emergency departments are the primary source for hospitalizations in the U.S. Hospitalizations represent about 30% of total health care expenditures, the largest share of health care spending.[219] As health systems move away from fee-for-service payment systems towards capitated/performance-based models, limiting hospitalization costs will become all the more important.[220] Many health plans require pre-authorization for non-emergency hospital services. Triage criteria algorithms have been developed to predict whether or not a patient will need inpatient care.[221] While the ED is a growing source of hospital admissions, primary care also plays a role. Access to quality primary care can play a role in preventing avoidable hospitalizations.[222]

Observation Units

There is a burgeoning literature on the use of observation units as a way to streamline care for patients with conditions requiring more than an ED visit and less than an acute care hospitalization. Patients that are not well enough for immediate discharge but not sick enough for hospital admission are often placed under observation status, which qualifies for outpatient payment under CMS 23-hour rule. Observation units are present in about one-third of all EDs and their use is growing. Use of observation care for ED patients has grown from 0.6% in 2001 to 1.9% in 2008.[223,224] Several studies have attempted

to quantify the savings that observations units can achieve if used appropriately,[225,226,227] but concerns have been raised that this practice ends up shifting costs onto patients.[228]

Palliative Care

There were several articles that focused on palliative care in acute care settings, with some description of developed programs. A growing body of literature in the acute care field is on palliative care. Chronic conditions in patients of advanced age often result in acute exacerbations requiring emergency care and hospitalization. Palliative care in the ED has been defined by the trajectories of illness and end of life; communication surrounding goals of care and quality of life; pain management; and prognosis and the bias of emergency care.[229] Quality improvement projects to improve palliative care in the ED have emerged recently.[230]

Care Coordination

More recent literature has emerged on care coordination in the ED (or the lack of it), specifically care fragmentation. Care fragmentation is described as care delivery that involves multiple providers and organizations with no single entity coordinating different aspects of care.[231] Fragmentation is associated with increased costs, preventable hospitalizations, and lower quality.[232] This topic will become increasingly important as provisions of the Affordable Care Act are implemented, particularly payment reform. Care coordination interventions focus on improving the organization of outpatient care through patient-centered medical home models, or, broadening the scope of services through social work and case management to coordinate care across settings. The Agency for Healthcare Research and Quality describes care coordination as, "…deliberately organizing patient care activities and sharing information among all of the participants concerned with a patient's care to achieve safer and more effective care. This means that the patient's needs and preferences are known ahead of time and communicated at the right time to the right people, and that this information is used to provide safe, appropriate, and effective care to the patient."[233] A significant body of research exists on using care coordination to reduce the number of acute exacerbations of chronic conditions, ED visits, and hospitalizations.[234,235,236] The chronic care model and care transitions program are examples of how better coordinated care can improve patient outcomes in patients with chronic illness.[237,238]

Hospital Readmissions

Readmission of hospital patients is a topic of high interest in the acute care system. One in six Medicare patients are readmitted to hospitals within 30 days of leaving the hospital.[239] CMS has recently implemented the Readmission Reduction Program as directed by Section 3025 of the Affordable Care

Act.[240] While reducing hospital complications may have an impact on reducing readmissions,[241] many patients return to the ED because either they feel that they are experiencing an acute episode and/or do not have access to a primary care provider.[242] Predicting risk-factors for readmission is a focus of the acute care system given that hospitals are being penalized for excess readmissions under the Readmission Reduction Program.[243,244] While there have been promising demonstrations that have been successful in reducing readmissions,[245,246,247] readmissions at the national level remain high.[248]

Vulnerable Populations

The acute care system is essential for vulnerable populations that have a higher risk of experiencing acute illnesses, injuries, and exacerbations of chronic conditions. While primary prevention efforts are important in reducing risk of an acute episode occurring, the acute care system can plays an important role in improving the health and wellbeing for these populations and reducing risk of future episodes.

Mental Health and Substance Use

Mental health and substance use disorders are also significant contributors to the demand for acute care services. The World Health Organization defines mental health as "a state of well-being in which the individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her community."[249] The U.S. Department of Health and Human Services defines mental illness as "collectively all diagnosable mental disorders" or "health conditions that are characterized by alterations in thinking, mood, or behavior (or some combination thereof) associated with distress and/or impaired functioning."[250] Examples of mental health disorders include depression, anxiety disorders, schizophrenia, eating disorder, and addictive behaviors.[251] In 2014, an estimated 33.7 million adults aged 18 or older had a mental health disorder (14%) and an additional 9.8 million (4.1%) had a serious mental health disorder.[252]

Mental health disorders are more common in individuals with substance use disorders than in the general population. Of the 20.2 million adults with a substance use disorder, 7.9 million (39.1%) had a coexisting mental health disorder, including 2.3 million with a serious mental health disorder.[253]

People with mental and substance use disorders are often treated by mental health professionals, such as psychiatrists.[254] However, visits to psychiatrists only represent half of all the mental and substance use disorders treated each year.[255] Primary care offices, EMS, and EDs are also at the forefront at

treating persons with mental health or substance use disorders with many more undiagnosed, making these estimates likely underestimated.

Among users of the ED, those with coexisting mental health and substance use disorders were the most likely to use the ED repeatedly, after controlling for patient, hospital, and community factors.[256] In addition:

- EDs treated over 2 million patients with intentional self-injuries – 4.4% of all injuries treated in EDs.[63]
- EDs treated over 2 million drug abuse visits, 27.1% involving non-medical use of pharmaceuticals (i.e., prescription or OTC medications, dietary supplements), 21.2% involving illicit drugs, and 14.3% involving alcohol in combination with other drugs.[257]
- The total number of drug-related ED visits increased 81%from 2004 to 2009 (2.5 million to 4.6 million). ED visits involving non-medical use of pharmaceuticals increased 98.4% over the same period, from 627,291 visits to 1,244,679.[257]
- Recognizing this need, many primary care offices are integrating behavioral health care services into their practice. Public health initiatives, such as increased distribution of naloxone for example, are aimed at reducing risk of fatality after opioid overdoses and have shown to be effective in ED settings.[258]

Interventions in acute care settings to help people with mental health and substance use disorders are numerous. Some examples include:

- Suicide prevention strategies in the ED aimed at reducing risk of a reattempt after discharge[259,260]
- Interventions in the ED include treatment for drug overdose[261]
- Mental health/ED collaborations[262]
- Mental health telemedicine / telepsychiatry [263,264]

EMS also plays an important role in the treatment and transport of persons with mental health and substance use disorders. Nearly one in every three ED visits for behavioral health reasons, including mental illness and substance abuse, were transported by EMS.[265] This estimate does not include all EMS encounters for behavioral health reasons, for example, persons who are seen but not transported to an ED or transported between facilities (e.g., nursing home to hospital). This may also be an underestimate in instances where a behavioral health issue is an associated but not primary reason for the ED visit. Despite the large number of encounters between EMS and behavioral health, this is a largely unexplored area of research.[266]

Pediatric and Geriatric Populations

There were several articles focusing on the specific needs of sub-populations of patients, such as pediatric and geriatric groups, noting the need for specialization to provide the highest quality care. As the population ages, geriatric adults account for an increasing proportion of ED visits.[267] Geriatric adults present to the ED with more severe illness and comorbid conditions, making management and timeliness of care especially important for this population.[268] Targeted evidence-based programs for hospitalized geriatric adults (e.g. ACE, HELP, NICHE) can be effective at improving outcomes in the acute care setting.[269,270]

Meeting the acute, unscheduled care needs for children presents unique challenges as highlighted in the 2006 IOM report: Emergency Care for Children: Growing Pains.[271] Children are especially vulnerable to acute exacerbations of asthma, which is the leading cause of ED visits and hospitalizations for children in the United States.[272] Children with chronic conditions are also susceptible to more serious acute conditions requiring ICU admission.[273,274] Given these concerns, parents are faced with a difficult decision on whether to bring their child to the ED or seek care in a different setting.[275] In many cases, parents will choose the ED to receive immediate care for their child.[276] Strategies to prevent ED visits and hospitalizations are therefore especially important for this population.[277,278,279]

Homelessness

The acute care system commonly encounters people experiencing homelessness. In the U.S., approximately 600,000 people are homeless on any given night, 7.9% of which are children and 9% military veterans.[280] There is a two-way relationship between acute illness and injury and homelessness. For many, the onset of a chronic condition (e.g., HIV, cancer), severe injury, or serious mental illness (e.g., schizophrenia) precedes and casually contributes to homelessness. Other acute health problems such as respiratory illness, hypothermia, and intentional injury are often consequences of living without permanent shelter. Additionally, a person who is homeless may have difficulty accessing health services, such as blood pressure medications, and thus experience exacerbations of existing health problems. Individuals who are homeless are more likely to use the ED as their regular source of care.[281,282,283,284]

Women who are homeless are victims of domestic violence or sexual abuse at much higher rates than the general population.[285,286] Compared to the general population, children who are homeless have rates of asthma six times higher the national average and frequently visit the ED for asthma or breathing problems.[287] High rates of emergency department visits related to alcohol or drug use are also found in this population.[288]

Rural Populations

People living in remote and rural areas face unique challenges in the acute care system. In the 2010 Census, 59.5 million people (19.3% of the population) were defined as living in a rural area and over 95% of the total land area is considered rural.[289] Rural populations face a number of geographic access barriers to health care. Growth in the regionalization of trauma services has improved access to trauma centers for many remote communities. Still, rural populations have been shown to have higher injury mortality rates than non-rural populations.[290] In 2008-2010, the unintentional injury mortality rate was 52.7 per 100,000 in rural counties compared to 32.3 in large metropolitan counties. [291] Almost a third of the rural population lives more than a 60 minute drive to the nearest trauma center compared to 12% of the urban population.[292]

In addition to injury, rural populations also experience higher rates of death from chronic conditions, such as COPD and heart disease, compared to urban populations.[293,294] Availability of health professionals, such as primary care physicians, mental health providers, and dentists are more limited in rural areas. Additionally, a higher percentage of the rural population is uninsured, making affordability of health care options a concern.

Veterans Health

The Veterans Health Administration (VHA) consists of 150 medical centers and 1,400 community-based outpatient clinics, community living centers, Vet Centers, and Domiciliaries. These facilities employ 53,000 providers that provide care to more than 8.3 million veterans each year.[295] While many veterans receive care at VHA facilities, veterans also have the option of seeking care from non-VA providers in times when an appointment cannot be secured in a VA facility or if they live far away from a VA facility. As of June 2015, 900,000 VA patients were authorized to seek care outside the VA system. A recent report has described the VHA ED care system as similar to the broader ED system; however, certain capacities for time-sensitive care for specific populations (e.g., stroke care; women's health) are still lacking in the VHA system.[296]

Disabilities

Over 56 million Americans have a disability, about 19% of the population. People with disabilities account for 40% of annual visits made to U.S. EDs each year and often seek care at an ED due to the urgency of their medical condition, lack of access to other care settings, and/or because they lack health insurance.[297] Disabilities are caused by many different factors, including depression, physical injury and chronic conditions. The top eight contributors to years lived with a disability were low back pain, major

depressive disorder, other musculoskeletal disorders, neck pain, anxiety disorders, COPD, drug use disorders, and diabetes.[298]

Policy and Delivery System Innovation

The environmental scan found policy initiatives that are aimed at improving the value of the acute care system. These policy initiatives have been implemented by both the government and private sector to reduce cost and improve quality. Technological innovations, such as HIT and telemedicine, are another approach to improving value in the acute care system.

Resource Utilization

In recent years, there has been a greater focus on cost-consciousness in acute care settings, and several articles demonstrating the variation in resource use across populations and specific interventions that may safely reduce certain high cost care, such as diagnostic imaging. The use of high cost diagnostics, such as CT and MRI, in the acute care setting is an area of debate in both the peer-reviewed literature and popular press.[299,300] A technical expert panel convened to identify actions in emergency medicine that could be taken to improve the value of emergency care involved using a more evidence-based approach to CT imaging.[301]

One approach to better management of resource is the adoption of clinical decision rules (CDR) or clinical decision support systems. A CDR is a clinical tool that aims to quantify the various components of a patient's medical history, physical examination, and laboratory results to help the provider make a decision about diagnosis, prognosis, or appropriate treatment.[302] In the acute care setting, CDRs have been developed to aid admission decisions for community-acquired pneumonia and acute asthma,[303,304] guide radiography use for head, ankle and knee injuries,[305,306,307] and help with risk stratification for low back and chest pain patients.[308,309]

Quality Improvement and Measurement

Quality improvement was also a focus of the review with a variety of articles exploring approaches in acute care settings. Quality improvement and quality measurement are important tools the acute care system uses to improve value and lower costs. For example, hospitals can reduce ED crowding through quality improvement processes that increase system-wide efficiency utilizing existing capacity throughout the hospital.[310,311] Recognizing the growing urgency to address ED crowding, CMS recently added measures of ED wait times into their quality reporting programs.[312,313]

Quality improvement and measurement aligns with the National Quality Strategy's[314] goal of reforming payment and delivery systems to reward value over volume, improve efficiency, quality, and reduce or eliminate waste. CMS can use payment incentives to motivate hospitals to improve acute care delivery efficiency. A key program to achieve the goals of the National Quality Strategy is the Hospital Value-Based Purchasing (VBP) Program. VBP was established by the Affordable Care Act of 2010 (ACA), which requires the Secretary of HHS to establish a value-based purchasing program for inpatient hospitals.[315] However, the impact of these types of pay-for-performance programs on hospital quality and value has not yet been established.[316]

Health Information Technology

Several articles were found on health information technology (HIT) that focus on how HIT may impact quality and/or how HIT adoption may be improved.[317] In recent years, there has been a major expansion of health IT use in EDs and other acute care settings. However, whether adoption of health IT improves appropriate care in the ED is not well understood.[318] Major issues in health IT in acute care settings include the lack of interoperability, the impact of clinical decision support, and the variation in usability of systems. Electronic personal health records are designed to make medical records and other information accessible to patients and enable patients to better manage their own health. However, adoption by patients has been low and it is not well understood what motivates people to use and continue to use electronic personal health records.[319]

Telemedicine

We found a number of recent articles on the use of telemedicine in acute care, particularly its role in caring for minor illnesses and within acute care hospitals to bring specialist expertise to rural settings. Telemedicine seeks to improve a patient's health by allowing communication (audio and/or visual) between a patient and a provider at a distant site or from the patient's home. Telemedicine can be a cost-effective alternative to face-to-face interactions that allow patients 24/7 access to a provider.[320,321]

Momentum for telemedicine appears to be growing.[322,323] According to research from Deloitte, approximately 12.5% of all outpatient appointments will involve some variation of telemedicine or electronic visit.[324] Google recently launched a trial version of a telemedicine service that, based on search terms, will give certain users the option to engage with providers using their video chat feature.[325] While telemedicine has traditionally been used by patients at their home, future settings of telemedicine for acute care episodes may include urgent care and retail clinics.[326]

Patient Safety

Patient safety is also a focus of acute care management. The 1999 IOM report, To Err is Human, estimated that there are up to 98,000 deaths per year due to medical error, which generated considerable media and government attention.[327] The IOM report called for a 50% reduction in medical errors in 5 years. While considerable progress has been made in some areas, medical errors are still a common occurrence in acute care settings.[328,329,330]

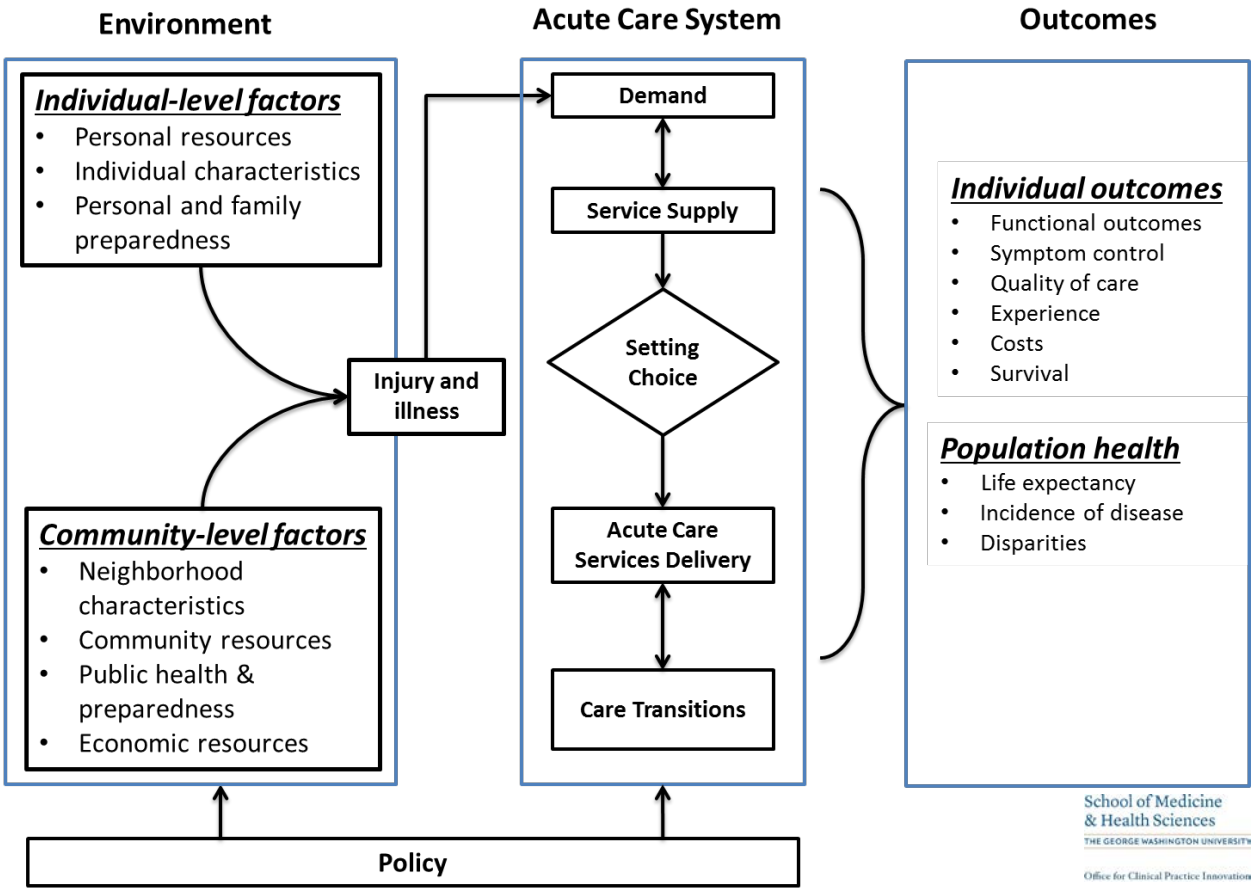
Aim 2: Model Development

The conceptual model for acute, unscheduled care was developed iteratively after receiving feedback from various stakeholders. The environmental scan informed an initial draft model, which included four domains: (1) Environment; (2) The Acute Care System; (3) Policy, and (4) Outcomes. The draft model was then reviewed by online focus groups using a concept mapping process. Perceptions were analyzed through naturalistic research techniques including concept mapping and thematic coding.[331,332] Nine domains emerged from the data collected in the focus groups: (1) Acute Care Infrastructure; (2) Expanding Access to Care; (3) Communicating Critical Information to Patients; (4) Post-Acute Care Coordination; (5) Patient Support and Decision Making; (6) Patient Influences; (7) Provider Influences and Skills; (8) Public Health and Policy; and (9) Outcome Measures. The initial draft model and these nine domains were then reviewed by a technical expert panel (TEP), which resulted in a revised conceptual model that reflected the TEP discussion. This revised model was then distributed for public comment to a wide audience of emergency care professionals for additional feedback. A final conceptual model for the management of acute, unscheduled care was developed based on all of these data collection methods.

2.1 Draft Model

The draft conceptual model for acute, unscheduled care, was developed by comparing concepts in existing healthcare models with the results of the environmental scan. Ultimately, the Anderson (1995) and Asplin I-T-O (2003) models contributed to the visual arrangement. Four domains were identified: Environment, Acute Care System, Policy, and Outcomes (Figure 4).

Figure 4: Draft Conceptual Model for Acute, Unscheduled Care (March 2014)



The "Environment" domain includes individual-level factors such as personal resources (e.g., education, connections with doctors), individual characteristics (e.g., age, health problems), and personal and family preparedness. Community-level factors such as neighborhood characteristics (e.g., geography, violence), community resources, public health and preparedness at the community level, and economic resources make up the main focus of this domain. Together, individual and community factors can lead to illness and injury, which creates a demand for acute care.

When there is a demand for acute care, people enter the "Acute Care System" domain which consists of a variety of resources and settings from EDs, to clinics, to telemedicine. In different communities, there are different supplies and availability of these services. Based on availability, people choose the setting to receive care themselves, may choose based on a recommendation from a healthcare professional, or may be brought to a particular setting by ambulance. After acute care is delivered in a particular setting, individuals are often transitioned back to the longitudinal care system (e.g., a patient's personal physician) or continue to receive care in the same setting.

"Policies" such as payment policy, quality measurement, or laws such as the EMTALA can impact the both the "Environment" and the "Acute Care System." Policies can impact individual factors, community factors, service supply, acute care services delivery and care transitions directly (i.e., through modifying risk factors [e.g., helmet laws for motorcycles]), through care delivery itself, and/or by how and whether information is shared across settings.

The result of an acute care visit is its "outcomes." Individual outcomes include functional outcomes, symptom control, quality of care, experience, and survival. Individual outcomes can also include costs of care to treat the injury/illness. The aggregate of these individual level outcomes is the health of the population, which includes metrics such as life expectancy, the incidence of disease, and disparities in care.

2.2 Online Focus Groups

Inclusion of stakeholder perspectives may help identify important factors that contribute to the management of acute, unscheduled care that the initial draft model may have missed. The input received from stakeholder focus groups was used to improve upon the draft model to better reflect actual experiences in the acute care system. The online focus groups were conducted between March 2015 and July 2015. Participants for the focus groups were recruited from patient and provider communities, including professional societies associated with the delivery of unscheduled care (emergency physicians, family practice, internal medicine, pediatrics, physician extenders, urgent care centers, retail clinics, virtual/telehealth providers), patient groups, payers (insurers and employers), policymakers, and hospital and health system administrators.

An initial list of 49 organizations was used to identify potential focus groups participants (Appendix A1). Key contacts at each organization were emailed a study introduction letter and participation instructions. Additionally, the study recruitment letter was emailed to the Urgent Matters database (approximately 8,000 members), whose membership includes physicians, nurses, and other stakeholders in emergency care.

Once interest in the project was expressed, the participants were sent an email containing a video about the project, a link to the project webpage, and instructions to login to the secure (SSL compliant) web portal to ensure privacy of participant identity. All communication with participants was electronic. Participants were referred to the webpage whenever possible to ensure consistency and continuity.

The recruitment process yielded a total of 107 interested participants. Each HHS region has representation from at least one participant (Table 3). The 107 participants were categorized into four stakeholder groups: patients, acute care providers (e.g., emergency physicians), other healthcare providers (e.g., primary care), and other stakeholders (e.g., payers, policymakers) (Table 4).

Table 3. Geographic Representation

Region	Recruited	Percent
I	6	5.6%
II	18	16.8%
III	29	27.1%
IV	9	8.4%
V	20	18.7%
VI	10	9.3%
VII	4	3.7%
VIII	2	1.9%
IX	8	7.5%
X	1	0.9%
Total	107	100%

HHS Regions: I (CT, ME, MA, NH, RI, VT); II (NY, NJ); III (MD, DC, DE, WV, VA, PA); IV (NC, SC, TN, FL, GA, AL, KY, MS); V (MI, MN, OH, IL, IN, WI); VI (TX, LA, AR, OK, NM); VII (MO, KS, IA, NE); VIII (ND, UT, SD, WY, CO, MT); IX (NV, AZ, CA, HI); X (WA, AK, ID, OR).

Table 4. Recruitment by Stakeholder Group

Stakeholder Group	Recruited	Percent
Patients	12	11.2%
Acute Care Providers	52	48.6%
Other Providers	15	14.0%
Other Stakeholders (e.g., policymakers payers)	28	26.2%
Total	**107**	**100%**

Brainstorming

The first step of the online focus groups was brainstorming. In brainstorming, participants submitted ideas of what they thought were key elements missing from the draft model. After participants logged in, they were instructed to review the draft model and give as many answers as they wanted to a single focus prompt: *"An additional issue that needs to be addressed in this model of acute, unscheduled care is…"* Brainstorming was asynchronous, so participants could contribute their ideas at any time during the period when the online portal was open. Concept Systems Global MAX © software (Ithaca, NY) was used as the online portal for focus group data collection and as the analysis tool.

The statements were collected anonymously through the online portal in Global MAX™. Participants were able to view all previously submitted statements before submitting their own. After all statements were submitted, the project team reviewed statements, combined similar statements together, and

removed incoherent statements. Statements generated during this phase of the research ensured that the elements included were derived by group consensus and lasted until a saturation of the topic occurred.

Of the 107 stakeholders recruited to participate in brainstorming, 55 completed this step (51% completion rate). The 55 participants that completed brainstorming generated a total of 211 statements in response to the focus prompt. The project team reviewed each response and created a final list of 89 unique statements. A sample of the statements is provided in the table below. The full list of the 89 statements can be found in Appendix A2.

Table 5. Sample List of Focus Group Statements

Statement ID.	*An additional issue that needs to be addressed in this model of acute unscheduled care is…*
1.	Preparing individuals for disasters and communities for public health emergencies.
13.	Including family members in a patient's care following discharge from an inpatient setting.
27.	Outcomes that can measure if the care experience was patient and family centered.
44.	Environmental factors that influence a patients' choice of when and where to seek care.
52.	How financial incentives/disincentives impact where a patient seeks care.
69.	Provider coordination of after care.
73.	How patients' work responsibilities impact use of acute care.

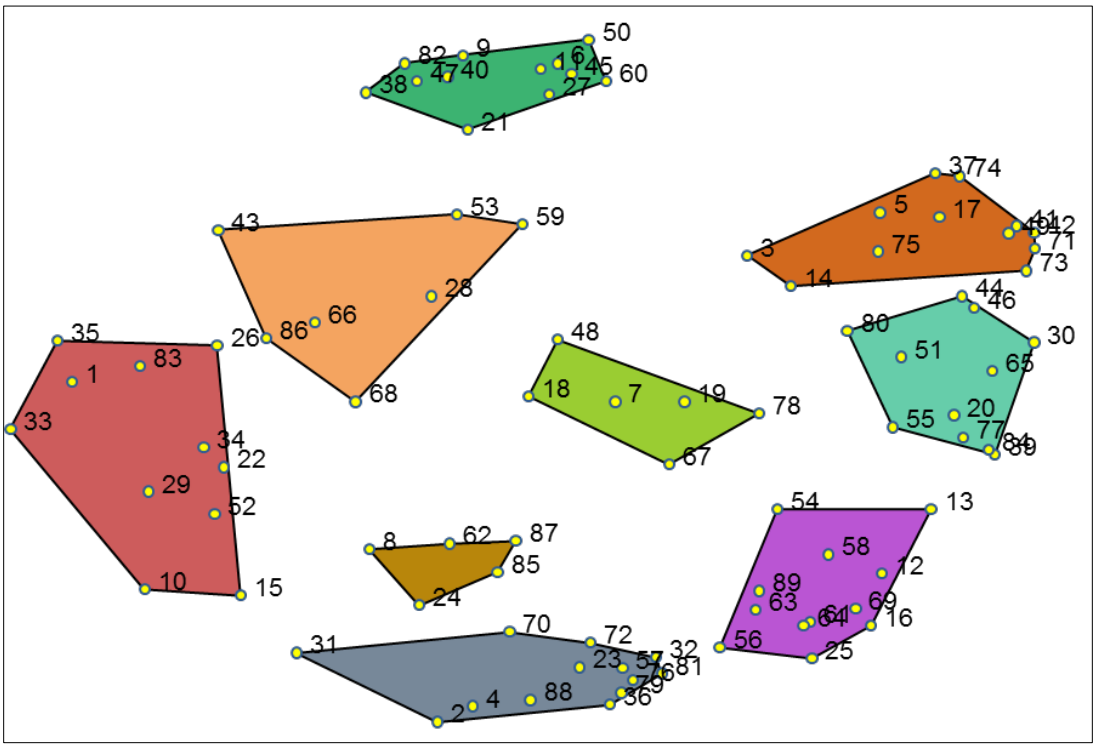
Sorting

The next step for the online focus groups was sorting. In sorting, participants grouped statements together based on how similar they felt the statements were to one another. Participants could create as many or as few groups as they felt relevant. Participants also named their groups as they desired (e.g., communication, patient experience, finance and payment). Unlike brainstorming, which solicited ideas from as many participants as possible, the sorting step was constructed to achieve equal representation across each stakeholder group. The target number for each group was set at 9-10 to obtain a total sample of 35 as recommended by the concept mapping methodologists. Once the target number was reached, enrollment was closed for that group. A total of 8 patients, 10 acute care providers, 6 other providers, and 10 policymakers/payers completed the sorting step.

Once sorting is completed by all participants, the Global MAX ™ software generates a visual representation of the data (Figure 5). Statements are placed into groups (clusters) through a proximal statistical process so that similar statements can be considered conceptually. The cluster map is a visual depiction of how closely related each statement is, based upon how all participants sorted the

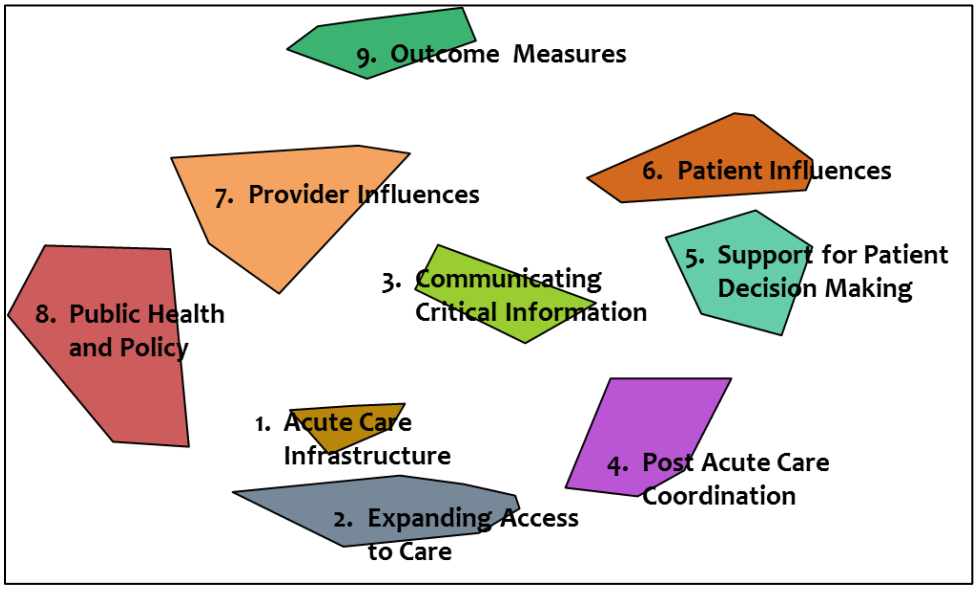
statements. Each color-shaded shape represents a conceptually different domain. The numbers in the color-shaded shapes correspond to individual statements. A total of 9 clusters emerged in the concept map. Close proximity of statements indicates that participants sorted statements in these clusters together more often than statements in clusters further apart. In addition, statement clustering contributes to similarity of meaning. The numbers listed in each cluster of the concept map represent the statement ID (N=89).

Figure 5. Cluster Map of Statements



The project team then reviewed the statements in each cluster to develop domain names. The Global MAX ™ system provides suggested domain names, which were edited for clarity by the project team (Figure 6).

Figure 6. Cluster Map with Domain Names



Each domain contains between 5 and 13 statements. Each domain is the aggregation of data from all stakeholders that participated in sorting. The research team created a domain summary based on the statements contained in that domain (Table 6). The domain summaries of the each have a different point of emphasis in the acute care system. At this step, participants did not comment on the importance of each domain. The ordering of the domains is random.

Table 6. Summary of Sorting Data

Domain	Domain Summary
1. Acute Care Infrastructure	Focus group participants highlighted acute care infrastructure issues of concern that point to organizational "bottleneck" points in the system. These include dealing with the transmission of patient data across settings, needs about policy to address emergency department boarding, the protection of health information, admission decision-making, and the need for transparency about wait times.
2. Expanding Access To Care	Access to care can be defined in many ways. Some logistic matters include the need for extended office hours, easier scheduling, and access to specialist acute care. Policy issues include access to more acute care setting choices, non-physician options, access to non-facility resources, and transport choices to other facilities other than an the emergency department.
3. Communicating Critical Information To Patients	Patients require a clear line of communication with providers, the policies that affect them, and their own medical history and records that document their health.
4. Post-Acute Care Coordination	The post-acute care experience includes a wide variety of issues that affect patients, their caregivers, available resources, and logistical arrangements. These can range from palliative care arrangement, to transportation after care, to follow-up access, to home healthcare, and availability of medications.

Domain	Domain Summary
5. Patient Support and Decision Making	Patients are faced with a variety of decision-making episodes throughout their experience with the acute care system. These range from decisions about how and if they will follow treatment plans, to decisions about what facilities to choose to utilize appropriate care, choosing the most convenient care, and choosing when to reuse the acute care system.
6. Patient Influences	There are a myriad of patient characteristics that affect utilization of the acute care system. Sex/race/ethnicity, use of traditional medicine techniques, substance abuse, diet and habits, and vulnerability are just a few that may come to mind. But in addition to these patient characteristics and behaviors, there are other factors such as a patient's ability to trust providers, their experience with the system, anxieties about illness, and misunderstanding about good health practices.
7. Provider Influences and Skills	Individual providers and the system itself influence care efficiency and quality. Reputation, track record, training and skill are often highlighted as key provider influences. Yet, care systems also influence efficiency and quality through their policies, patient stratification practices, educational effectiveness, and communication skills.
8. Public Health and Policy	There are a number of policy issues that affect individual and public health related to acute care providing. On the individual level, polices about medical record maintenance, access to care for legal and illegal immigrants, and information about environmental risks have been mentioned. On the community level, notification about infectious disease, preparedness or disasters, and charity support for those in need impact care provided. On the more universal level, issues of malpractice for providers, care reimbursement, individual insurance policies, and financial incentives/disincentives also impact care access and quality.
9. Outcome Measures	Outcomes from the acute care system are numerous and multileveled. They range from individual return to work/school rates, cross-disciplinary care coordination, access to follow up care, quality of patient-and family-centeredness, cost and reimbursement, quality of life post-acute care, and emotional aspects.

Rating

After sorting, participants rated each statement on a scale of 1 to 6 (1= "Relatively unimportant to include in the model" to 6 = "extremely important to include in the model"). The average rating across all statements was 4.4 (95% CI 4.2 - 4.6).

Ratings for statements in each domain were averaged and compared across stakeholder (Table 7). Post-acute care coordination was the highest rated domain for acute care providers, other acute care stakeholders, and the second highest rated domain for other health care providers. For patients, expanding access to care and communicating critical information were the two highest rated domains. Patient influences were ranked lower compared to the other domains across all four of the stakeholder groups.

Table 7. Average Domain Ratings by Stakeholder Group

Domain	Patients (n=8)	Acute Care Providers (n=10)	Other Providers (n=6)	Other Stakeholders (n=10)	Overall Mean Score
Post-Acute Care Coordination	4.6	4.8	4.7	4.7	4.7
Communicating Critical Information	4.5	4.6	4.6	4.5	4.6
Expanding Access to Care	4.7	4.3	4.7	4.5	4.5
Acute Care Infrastructure	4.6	4.8	3.7	4.3	4.4
Outcome Measures	4.2	4.1	4.4	4.5	4.3
Support for Patient Decision Making	4.4	4.4	4.2	4.2	4.3
Provider Influences	4.6	4.4	3.8	4.0	4.2
Public Health and Policy	4.5	4.0	4.1	3.9	4.1
Patient Influences	3.5	3.4	3.5	3.7	3.5

Ratings for individual statements within domains were also examined. Statements were identified as having high importance in all four stakeholder groups if they scored an average rating of 5.0 or higher (Table 8).

Table 8. Statements Rated Highly Important (>5.0) Across All Stakeholder Groups

Item Number	Statement	Average Rating (1-6)
79	Availability of acute care options for the mentally ill.	5.5
8	Having a communication infrastructure that allows acute care providers to transmit patient information across settings.	5.5
39	Patient understanding of the care plan to avoid readmissions/revisits.	5.5
57	Ability to schedule care quickly in a primary care setting to accommodate acute, unscheduled visits.	5.4
77	Understandable discharge instructions.	5.4
64	Accessible/reliable follow up post-acute unscheduled visit.	5.4
81	Convenient and timely access to urgent care settings.	5.3
23	Having alternative community setting for acute, unscheduled care such as urgent care or retail clinics.	5.2
25	Access to specialty care after an emergency department or primary care visit.	5.2
29	Reimbursement for primary care.	5.2
21	Outcomes that measure access to follow-up care.	5.2
72	Availability of resources that do not require a visit to a facility (e.g., mobile health providers, nurse triage line, community health workers, school and work-based providers).	5.1
18	Ensuring careful review and consideration of patients' current medications during and after acute care.	5.1
7	Communicating information to patients and their families about services offered (e.g., hours of operation, nurse help lines, email to physicians, etc.).	5.1

Item Number	Statement	Average Rating (1-6)
78	Providers taking patient concerns seriously and taking the time to understand them when they seek care for what may seem to be a trivial problem.	5.1

Finally, statements that were rated highly by patients but low by the other all other stakeholder groups were looked at. These statements may be an indication of areas in the acute care system that are important to patients but are overlooked by providers and other stakeholders. Statements that received an average rating of 4.4 or higher by patients but 4.0 or lower by providers and other stakeholders are presented in Table 9. A full list of the statements and ratings are available in Appendix A3.

Table 9. Statements Rated Higher by Patients (Average Rating (1-6))

Item	Statement	Patients (n=8)	Providers + Other Stakeholders (n=24)
36	The military health system and veteran health issues.	5.1	3.6
37	How individual behaviors such as smoking, alcohol, drug use, and participation in risky behaviors impact use of the acute care system and outcomes.	4.8	3.9
14	How one acute care problem often leads to more acute problems.	4.6	3.5
80	Patient understanding of how to interpret and pay a medical bill.	4.6	3.5
42	How a person's diet and nutritional status impact their health.	4.5	3.5
15	How medical resources can be mobilized to reach large numbers of non-acute patients at public events.	4.5	3.5
19	Knowing a patient's predisposition for disease based on family history.	4.4	3.5

2.3 Technical Expert Panel

A technical expert panel (TEP) was selected to represent a variety of perspectives and backgrounds. TEP members were recruited through the original organizations that received the invitations to participate in the online focus groups and through networking. The goals of the TEP were to first, further refine the conceptual model and second, develop of a list of ways that stakeholders could improve the value of acute care delivery.

TEP Participation and Preparation

A total of 17 stakeholders participated in the TEP. Members included representation from each of the four stakeholders groups: acute care providers (n=7), other healthcare providers (n=4), patients (n=1), and other acute care stakeholders (n=5). Six of the TEP members were female while 11 were male. The

TEP members came from the following states: DC (4), CA (4), PA (2), IL, CT, CO, OH, MA, GA, and MD (one each).

The TEP meeting was held on two separate days in August 2015. Each meeting used the same format, agenda, and discussion questions. The meetings were held in-person and through synchronous video conferencing, allowing participation from TEP members who could not travel.

Prior to the meeting, the TEP received the draft model and discussion questions. The panel began with a presentation from the project team on the overall project objective, project methods, and the development of the initial draft model. The TEP was then presented the findings from the online focus groups, including the nine domains that emerged from the concept mapping analysis. The meeting was moderated by the project methodologist.

TEP Discussion

After the presentation, the moderator asked TEP members to respond to the discussion questions (Table 9). Both TEP meetings were audio recorded. The research team reviewed meeting notes and the audio files and organized the data by stakeholder: (1) Patients, (2) Providers, and (3) Policymakers/Payers.

The research team then discussed how the TEP data should be represented in the final model. Each discussion point was placed in one of four categories: (1) social and individual determinants of health, (2) care decision making, (3) care delivery or (4) outcomes to represent where it would be placed on the model. Updates were made to the model based on this analysis.

The table below highlights the key points from the TEP discussions around each domain/focus question.

Table 10. TEP Discussion Questions

Domain	Discussion Question	Synthesis of TEP Discussion
Acute Care Infrastructure	How can the model better address infrastructure issues like these "bottle-neck" points within the acute care setting? Please speak to the model itself.	The TEP discussed how patient knowledge emphasizing health system literacy impacts individual level factors and how patients access care. It was noted that both insurance status and transportation could span individual factors and injury/illness. The group deliberated on how to display bottlenecks that impact service delivery in the model. It is also important to mention different systems have different types of bottlenecks. The TEP felt it was necessary to consider access to care, registration procedures, integration, and connections between the acute care setting and primary care.

Domain	Discussion Question	Synthesis of TEP Discussion
Expanding Access To Care	Generally, where should "access point" issues be addressed in the model?	The discussion started around barriers to access such as geography and insurance status and how these factors influence both setting choice and care transitions. It was noted that convenience can be a driver of access. TEP members felt it was important remember there are many access points into the acute care system. The discussion moved on to how these points of access could be visual represented on the model.
Communicating Critical Information To Patients	What are the communication pathways that need improvement in the model, and what might those pathways need to include?	The TEP spent a significant amount of time discussing communication pathways across, between, and within entities. Issues of quality control and transparency were raised. TEP members noted insurance treatment coverage, health literacy, and provider/patient relationships as additional factors that impact communication.
Post-Acute Care Coordination	Focusing on the acute care service and post care transitions what additional elements should be highlighted in the model as having an impact on patient post care?	The importance of care and information integration across the system impacts transitions was discussed. Links and connections between supply and demand were debated. The availability of services such as medications, equipment and follow up were identified as influencers of post-acute care coordination. In addition, the TEP expressed concern over how an episode of care that spans across settings (e.g., ED, PCP, back to ED, outpatient) would be represented in the model.
Patient Support and Decision Making	Assuming that patients will return to access services at some time after an episode, what factors might affect their decision-making upon reuse of the system?	The TEP discussed the importance of patients needing to understand their condition in order to make an informed setting choice. It was noted that both convenience and accessibility influence decision making as well as communications pathways (i.e., acute care provider to chronic care provider, acute care provider to patient)
Patient Influences	Where does the model lack a description of how these patient influences affect other parts of the model?	The TEP discussed how the burden of disease within a specific environment was addressed. The impact of post-acute care on transitions with environment was discussed The TEP debated how best to address health literacy, insurance status, and service disparities in the model. In addition, the TEP discussed building patient/provider trust and creating activated patients.
Provider Influences and Skills	Where does the model lack description about how these provider influences affect other parts of the model?	The TEP discussed the influence of organizational culture rather than individual provider/influences on patient relationships. The relationship between provider influences and outcomes were debated. The best way to visually display mismatches of supply and demand in terms of specialists was examined. Additional influencers included economics, ethics, and interpretation/understanding of treatment and follow-up.
Public Health and Policy	How can we better address these multi-layered policy issues within the model?	The discussion centered on how to best display policy by individual, community, and universal levels. TEP members felt strongly that outcomes should inform policy on the model. In addition, public systems that assist patients to the right settings were discussed.

Domain	Discussion Question	Synthesis of TEP Discussion
Outcome Measures	How could the model better address these multilevel outcome measures?	TEP members discussed links between care and outcome measures, patient vs. provider expectations, and reporting structures. It was noted that outcome measures can be valued and used very differently depending on the stakeholder reviewing results. How to measure system demand and the best way to visually display feedback loops were debated.

2.4 Public Comments

The research team solicited comments on a resultant revised version of the conceptual model using the "Urgent Matters" website and subscriber database. Using an electronic form, participants were asked to review the model and respond to an open-ended short survey. Forty people provided comments. The majority of the responses came from acute care providers. A completed breakdown by stakeholder can be seen below in Table 11. The research team reviewed the comments, and made additional revisions to the model. These modifications included clarifications in the visual display of the model and the terms used. A full list of public comments is available in Appendix A4.

Table 11. Public Comment Response

Stakeholder Group	Responses
Acute Care Providers	26
Providers (not acute care)	5
Patients	3
Other Acute Care Stakeholders	6
Total	**40**

Section 3: Final Model

Existing models such as Asplin and Anderson have limitations that do not capture all of the specific factors influencing acute unscheduled care across the continuum. Asplin was focused specifically on ED crowding, while Anderson was more general and was not specific to acute unscheduled care. Therefore, we developed a new model (Figure 7). Existing models were used as a basis for stakeholder discussion, and ultimately we created a novel model that captures the unique and critical role the acute care system plays in healthcare delivery based on multi-stakeholder input. Conceptually, the model follows an "episode" of acute care that starts with an acute event (i.e., illness, injury, or an exacerbation of a chronic condition) and ends with an outcome. Illness and injury episodes start when it occurs and ends when symptoms resolve, become a chronic condition, or lead to death. Chronic conditions can also

have episodes of care, which start and end with patients returning to their usual state of health, new health state, or death. A recognized limitation of the model is that "acute care episodes" are a simplification of how acute illness and injury occurs in real-life and some episodes may not have clear start and end points. However, the concept of an episode was used to describe the trajectory of illness and injury from start to outcome to illustrate factors impacting the development of illness, setting choice, care delivery, and outcomes.

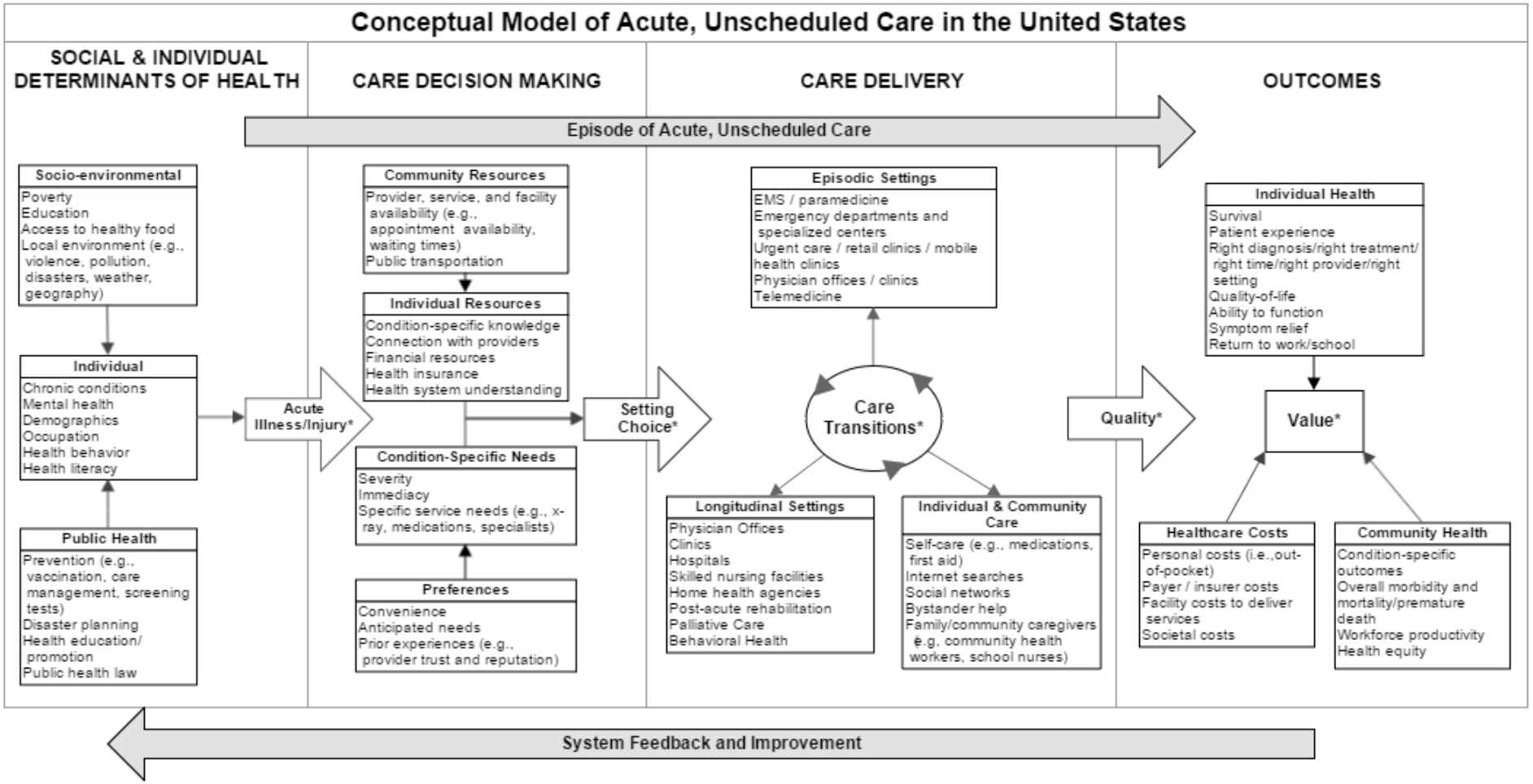
Acute care episodes occur in the context of SOCIAL & INDIVIDUAL HEALTH DETERMINANTS, which include *Socio-environmental* determinants, *Public Health* determinants, and *Individual Health* determinants, which together impact the likelihood that people experience an acute illness/injury, or an acute exacerbation of a chronic condition. Once a person becomes ill or injured, there is a process of CARE DECISION-MAKING whereby a decision is made for a person to receive medical care in the acute care system or opts for self/family care. Sometimes patients makes this decision themselves, while other times the decision is made by other people such as physicians, family or community members, or other personnel (e.g., ambulance staff). This setting choice is determined by *Condition-specific Needs* (i.e., the services and resources required to treat the patient at the time they are ill or injured) in the context of *Preferences* for care settings, along with both *Community Resources* and *Individual Resources*.

CARE DELIVERY for an acute care episode can be provided in different care settings: *Episodic Settings* or *Longitudinal Settings*, and often involves *Individual and Community Care* at some point during the episode. Episodic care settings are ones that are designed to care for patients for a single encounter and do not follow patients over time. These settings include pre-hospital care (i.e., ambulance), hospital-based and freestanding EDs, urgent care and retail clinics, and direct-to-consumer telemedicine. Acute care is also delivered longitudinally, meaning that patients receive care over an extended period of time within the same setting. Longitudinal care is designed to manage patients over time and may manage an acute care episode but also treats the patient over many days, months or years. Examples of longitudinal care include primary care doctor's offices, office-based specialists, community health clinics, inpatient hospital care, skilled nursing facilities, and post-acute rehabilitation.

Most acute care episodes occur across multiple settings. Care may transition from episodic to self-care, from longitudinal to episodic, and so forth. For example, a patient may fall ill with abdominal pain (acute illness/injury) and initially make the choice (CARE DECISION-MAKING) to be seen in an urgent care center. The urgent care provider may refer the patient an ED (*Care Transitions*) where a physician diagnoses the patient with appendicitis .The patient may be later treated by a surgeon who performs an

appendectomy in the hospital. After hospital discharge and a follow-up appointment with the surgeon, the patient may be transitioned back to a primary care physician or other caregiver (*Care Transitions*). How care and information transitions between these settings and the degree to which providers coordinate with one another is an important component of the system and the episode.

Figure 7: Final Conceptual Model



* **Acute Illness/Injury** - The likelihood of a person experiencing an acute illness or injury is determined by social and individual health determinants, public health measures, and socio-environmental factors. Acute illness / injury includes debilitating medical illness (e.g. influenza, pneumonia, or myocardial infarction), acute injuries (e.g. hip fracture), exacerbations of chronic diseases (e.g. heart failure exacerbation), acute mental illnesses (e.g. severe depression or psychosis), and/or effects of substance abuse (e.g. intoxication).
* **Setting Choice** - Setting choice is determined by both individual and community resources (e.g., provider and facility availability when patients are ill/injured), personal preferences (e.g., convenience of the setting), and the condition-specific needs (e.g., resources needed to diagnose and treat the patient). Setting choice can be determined by the individual experiencing the acute illness/injury, family, friends, and EMS.
***Care Transitions** - Care transitions refers to the movement of a patient's care and information between different health care settings (e.g. episodic to longitudinal) and home (e.g., self care and management). Also includes the provision of a care plan to patients, patients' understanding of the care plan, and mechanisms to communicate the care plan across settings.
* **Quality** - Healthcare quality including the following Institute of Medicine domains: safety, effectiveness, patient-centeredness, timeliness, efficiency and equity. (IOM). Healthcare quality results from the care that was delivered and impacts healthcare outcomes.
* **Value** - Value is defined as achieving the best possible individual and community outcomes per cost outcome (e.g., health dollar spent).

Acute care episodes have outcomes that can be measured as *Individual Health* or *Community Health* outcomes; in addition, acute care episodes incur *Healthcare Costs*. The relationship between CARE DELIVERY and OUTCOMES is impacted by *Care Quality*. Outcomes can influence many aspects of an acute episode, which is represented by several "feedback" loops in the model. Outcomes can influence care delivery, which can influence future outcomes (e.g., performance measurement and quality improvement). Care delivery can impact individual and community resources, which can impact future care delivery (e.g., a community health center opens, providing preventative health screenings, a regular source of care, and specialist referrals for underserved residents). Finally, *System Feedback and Improvement* describes how outcomes, care delivery, and care decision-making can feed back to influence earlier phases of an episode of acute care. For example, outcomes (positive or negative) may influence care delivery which adapts to improve delivery or reduce costs. Outcomes can also impact care decision making, including the preferences for care settings. *System Feedback and Improvement* describes how later phases of the model feedback on earlier phases, and work to continuously impact the demand for acute care, how people decide where and when to seek care, and how that care is delivered.

Next, we describe each of the major components of the model as described in the literature, online focus groups, and technical expert panels. The model describes the social and individual determinants that impact whether someone gets sick or injured, factors that go into care decision making, various care delivery settings, and outcomes at the patient and community level.

3.1 Social and Individual Determinants of Health

Socio-environmental (or socio-ecological) models places the individual within the context of their family, community, and larger society.[333] As applied to healthcare, socio-environmental models have been used to describe barriers to prenatal care, the impact of chronic conditions on workforce participation, HIV risk, and domestic violence prevention.[334]

Socio-Environmental Determinants

In general, socio-environmental determinants refer to wealth, poverty, religion, and education, which all may influence health and access to it.[335] Socio-environmental determinants can also describe barriers to healthy foods, which lead to unhealthy diets and adverse health outcomes; poor housing quality, which can cause health problems (e.g., mold causing asthma exacerbations); weather, which can predispose to

certain types of illness (e.g., heat stroke, hypothermia); violence, which can directly cause physical injury; and other factors such as pollution and natural disasters.

Individual Determinants

By contrast, individual determinants are factors most closely associated with persons and their individual family units, like presence of chronic conditions, ethnic and cultural factors that can predispose individuals to specific diseases, behaviors that negatively impact health, health literacy, availability of insurance, personal and family preparedness, and occupation. As conceptualized in our model, the presence (or absence) of public health measures, socio-environmental determinants, and individual determinants all contribute to the probability that a person will experience either an acute illness/injury or an acute exacerbation of a chronic condition.

Public Health

Public health is often defined as the organized efforts to prevent disease, promote health, and prolong life among the population as a whole.[336] These efforts include disaster planning, community response to health crises, health education campaigns, and laws that promote healthier societies (e.g., public smoking bans). Public health can also include primary and secondary prevention measures, such as childhood vaccinations, screening tests for chronic conditions, and disease management.

3.2 Care Decision-Making

Care seeking decisions are a focal point of the conceptual model since a major goal of health reform is to ensure that patients' conditions are treated in settings that match condition-specific needs and preferences while minimizing costs. When patients become ill or injured they may be faced with a choice about where to seek care or to try to manage their illness/injury at home. Setting choice is important because it has clinical and economic consequences: different settings have variable capabilities and capacities to care for different types of patients and conditions. There is also wide variation in the cost of treating similar conditions at different settings.[337] [338] [339] For some conditions, such a trauma and stroke, setting choice is dictated by prehospital providers that follow specific triage protocols to determine the best setting to treat a patient. Several factors influence the care seeking decision: condition-specific needs, patient/family preferences, and individual and community resources.[340]

Condition-Specific Needs

Condition-specific needs are determined by the severity of the medical condition itself – for example, conditions that are more severe in nature tend to be seen in EDs (e.g., motor vehicle crash or AMI) while lower acuity conditions may be treated in office-based settings or community clinics. Immediacy is also an important factor in deciding when a condition should be addressed. Immediacy is the actual or perceived need that a condition must be treated within a specific timeframe. Often the actual need for immediate care is different from the perceived need by the patient. Complicating decision-making is the fact that condition-specific needs are often unknown to the patient who is ill or injured or their family. It is not uncommon to over or under-estimate severity and immediacy because most patients lack specialized medical knowledge. When a condition is perceived to be severe and may need immediate attention, patients tend to pick settings where they can be seen rapidly without an appointment (e.g., an ED or urgent care center).[340] Other conditions may be amenable to home care, such as soft-tissue injuries that do not require laceration repair, or minor pains. Some conditions may require specific resources only available in some settings, such as advanced radiological imaging. In other cases, condition-specific needs may be achievable in a variety of settings, for example ambulatory conditions that only require a provider evaluation and a prescription.

Preferences

Patient and family preferences play a major role in care decisions. Preferences may be formed by prior experiences with the healthcare system, provider and health system trust, and where people think they will get the best care. Preferences may be for specific facilities or physicians that have good reputation. Convenience is also a powerful factor that impacts patient preferences. Patients frequently base care decisions on what settings are in close proximity to their home or work and are open at a convenient time.

Community Resources

Community resources include the availability of acute care settings, including pre-hospital care, urgent care centers, retail clinics, EDs, telemedicine, doctor's offices, and clinics. Urban patients with low socio-economic status sometimes use EDs for low-acuity conditions. This is because even though their condition-specific needs may be treatable in a clinic, they may not have the resources (e.g., insurance or transportation) to access it. In some communities, the ED may be the only health care option that

provides a timely service when the patient needs it. In addition, patients may prefer EDs over other care settings because of perceptions of quality and/or trust.[341] [342]

Individual Resources

Condition-specific needs and preferences are considered in the context of individual and community resources. Individual resources include a patient's connection with a physician who can help determine the need for and level of care, a person's knowledge of their condition and how to navigate the acute care system, and personal financial resources. Financial resources include ability to afford out-of-pocket costs for services, transportation availability, and insurance status. Insurance is of particular importance as availability of insurance type and insurance subsidies vary greatly depending on occupation, income, and state of residence.[343] Some settings require longer wait times for patients with Medicaid insurance because of lower reimbursement.[344]

3.3 Care Delivery

Acute medical care can be delivered in episodic, longitudinal care settings, or with self/family care. Episodic and longitudinal care often involve a face-to-face visit in a physical setting; however, care can also be delivered through telemedicine or through asynchronous communication such as email, voice mail, Skype, and other visual technologies.

Episodic Settings

Episodic settings like EDs provide constant care and employ trained emergency care specialists and have access to advanced equipment, laboratory testing, radiography, and disciplinary specialists. Hospital-based EDs are contained within acute care hospitals and some freestanding EDs are affiliated with hospitals and can admit patients directly when necessary. Since not all hospitals have the same capabilities, some episodes of care may require a hospital-to-hospital transfer for advanced services such as a neurosurgeon or hand surgeon.[345] Urgent care clinics have less extensive capabilities, but can still evaluate patients who require basic laboratory testing, plain radiography, or minor procedures. Retail clinics care for a small set of minor conditions, and are commonly staffed by non-physician providers. Direct-to-consumer telemedicine is an emerging area with a variety of services that involve virtual online encounters, but allow limited patient examination. Outpatient physician offices have variable access to services and consultations that vary widely based on how they are structured with

some facilities having comprehensive lab and radiology services on site, while others are limited to basic tools available in a freestanding office.

Longitudinal Settings

Longitudinal settings include physicians' offices and clinics that often will treat patients multiple times over an extended period. It also includes skilled nursing facilities, home health, post-acute care facilities, and inpatient hospitals. As patients are evaluated over longer periods, providers get to know patients and have better insight into their conditions. Longitudinal settings have varied resources: physician offices and clinics may have little access to same day radiology or laboratory testing, and providers have varied skill sets in diagnosis and treatment. Larger facilities also are staffed by different types of providers and have different capacities and capabilities.

Self and Family Care

In addition to episodic and longitudinal care, patients and families have a diversity of situational literacy to handle medical illness and injury.[346] For example, actively involved family members can make certain home-based care plans feasible while without help, sometimes hospital care may be avoidable.

Care Transitions

Care transitions are the process by which information is transferred between providers within and across settings, and how care is coordinated from one provider to the next. Care transitions are one of the major issues in U.S. healthcare because of the fragmented nature of how the system is designed. Many acute care providers commonly do not have complete information about prior care and care plans when patients present to episodic settings. This is because health information is often secured within clinic records or specific electronic health records, and there is poor interoperability and usability of HIT across and even within health systems. As a result, relevant information is often not available or difficult to obtain at the point of care, which makes it challenging to make clinical decisions that are cost-effective.

3.4 Outcomes

Outcomes of acute, unscheduled care can be measured at the individual-level and community-level.

Individual Outcomes

Individual-level outcomes include measures such as survival, patient experience, correct diagnoses and treatments, patient feelings of reassurance, symptom relief, quality of life, ability to function, understanding of an acute care episode, ability to return to work, and out of pocket costs of care.

Community Outcomes

Outcomes at the population level can be the aggregated individual-level outcomes such as survival rates for a specific conditions or overall, rates of correct diagnosis and treatment, workforce productivity (i.e., lack of absenteeism), and aggregated costs from multiple perspectives.

Cost Outcomes

Reducing costs while simultaneously improving outcomes is what ultimately improves the overall value of the health care system. Costs can be measured on the personal level, such as out-of-pocket copayments and deductibles that a patient owes after receiving care. Personal costs also include employee contributions to health care premiums or costs of purchasing insurance through health insurance exchanges, or from missing work to receive healthcare. On the aggregate level, healthcare cost outcomes include the total health care "bill" (e.g., total dollars spent on health care as or as a percentage of the GDP). In addition, costs to facilities, employers, and payers, such as CMS and commercial insurers, can be aggregated at the beneficiary or population level.

3.5 System Feedback and Improvement

There are several relational aspects embedded in the conceptual model between domains of social and individual determinants, care decision-making, care delivery, and outcomes. This occurs through System Feedback and Improvement, as later phases of acute care delivery feedback to impact earlier ones. For example, outcomes can impact other components of the model: care delivery can improve through continuous quality improvement in response to patient and population outcomes; and outcomes can modify setting choice through their impact on patient preferences. Care delivery and the way it is structured can impact setting choice. Specifically, care delivery can be designed to meet condition-specific needs and patient preferences (i.e., become more patient-centered), and as care delivery changes, it can impact community resources for services. Finally, outcomes of acute care delivery can

feedback and impact social determinants, such as public health law, individual determinants of health, and individual resources and community resources, as well as condition-specific needs and preferences.

Section 4: Influencing the Delivery of Acute Unscheduled Care in the United States: Recommendations

Patients, families and communities, providers, policymakers, and payers are able to influence quality and outcomes of the delivery of acute unscheduled care in a variety of ways. The team used data from the environmental scan, focus groups, and the technical expert panel to develop a series of general recommendations about how each stakeholder's role can influence the acute care system and its outcomes. Below is a description of the role of each stakeholder and some of the ways each can engage in influencing acute care delivery, primarily in positive ways.

Table 12. How Stakeholders Can Positively Influence Episodes of Acute Care Delivery

PATIENTS, FAMILIES, & COMMUNITIES	• Activated patients, families & communities • Engage in healthy behaviors • Manage chronic conditions	• Increase knowledge about health; self-care; how to use the system	• Facilitate information transfer • Actively participate in diagnosis and treatment
PROVIDERS	• Ensure evidence-based prevention • Actively educate patients • Proactively manage health; chronic conditions; anticipate barriers	• Improving access to acute care when patients get sick • Guide patient-decisions about setting in real-time	• Ensure adherence to evidence-based guidelines • Continuously improve care and quality • Ensure free flow of information • Enhance coordination; communication across settings
POLICYMAKERS & PAYERS	• Ensure evidence-based prevention is implemented • Enact public health laws to enhance prevention • Align patient incentives for good health behaviors	• Align incentives of providers to meet patient needs • Ensure workforce meets care needs • Align patient incentives for cost-efficient system use	• Enhance quality measurement • Reward best practices

4.1 Recommendations for Patients, Families, and Communities

Patients, families, and communities are important partners in ensuring that people engage in healthy behaviors, actively manage medical conditions, and engage with the medical system to ensure that care plans are effective and that transitions in care are seamless.

1. **Engage in health behaviors and manage chronic conditions.** Patients, families, and communities can engage in healthy behaviors and actively managing chronic conditions to reduce the incidence of acute illness and exacerbations of chronic conditions. This involves reducing adverse health behaviors such as smoking and illicit substance use, ensuring that foods consumed are healthy, and engaging in regular exercise. When it comes to chronic conditions, patients, families and communities need to work to ensure adherence to recommended treatment plans.

2. **Improve health literacy.** Patients, families, and communities can educate themselves about how to prevent illness and injury, what to do when they get sick or injured, and how to take care of themselves at home if necessary. In addition, patients should work closely with providers when it comes to choosing diagnostic and treatment options, ensuring that treatment plans are in line with patient preferences. Achieving this successfully involves improving health literacy.

3. **Actively engage in understanding the healthcare system.** Patients, families, and communities can take an active role in understanding local healthcare resources and how best to use them.

4. **Improve information quality and flow.** Given the variation in systems that facilitate information transfer, patients and their families can facilitate acute care delivery and transitions by ensuring their own data are available across providers and settings. Many people carry medication and problem lists with them to acute care encounters. Patients and families should also be active and empowered to point out potentially conflicting care plans across providers, who may be unaware of the "whole" picture of their care.

4.2 Recommendations for Individual and Institutional Providers

Individual and Institutional Providers can work to reduce the demand for acute care by addressing social and environmental determinants and through creating programs that prevent acute illness and injury,

and create patient-centered ways to communicate during and after an illness, and educate patients on prevention, illness management and health system use.

1. **Ensure evidence-based prevention.** Providers can positively impact both social and individual determinants of health by implementing evidence-based prevention efforts, and educating patients about prevention. This includes both primary prevention (i.e., smoking cessation), and secondary prevention (management of chronic conditions, such as blood pressure).

2. **Actively educate and engage patients and families in their health.** Providers should make it a priority to arm patients and families with the best knowledge about their health, and specifically about conditions that may have a higher likelihood of impacting their and their families' health. This involves teaching patients to anticipate barriers to health and actively engage in managing patients' chronic conditions in ways that are tailored to patient-specific needs. Providers can also educate patients about how to manage specific acute illnesses and injuries, and anticipated exacerbations of chronic conditions.

3. **Improve access to acute care when patients get sick and injured.** Providers can improve the efficiency of setting choice by enhancing access to care during an acute illness to the patients. Outside of the ED environment, this can be done through improving scheduling, extending office hours, and increasing transparency around waiting times.

4. **Guide care-seeking decisions in real time.** Providers should develop systems that are available 24/7 to help assess and guide patients to meet condition-specific needs in the context of patients and families preferences in real time. This can be done through telephonic or asynchronous communication, or through patient-facing tools.

5. **Adhere to evidence-based guidelines, work to develop standardized care pathways, and actively coordinate care.** Providers can improve care delivery by adhering to evidence-based guidelines and quality standards. In addition, providers should work to coordinate care across settings during transitions, particularly high-risk ones. There should be clear plans for follow-up care if needed. Patients and their families should be provided with information about their condition and test results and what symptoms mean their condition is worsening. Health systems can also work to standardize care through care pathways, and facilitate care coordination across settings by building usable systems for providers to share information and

communicate. Specifically, creating systems that allow for easy transitions across settings by developing systems for providers to communicate and facilitate seamless follow-up care. This will require longitudinal providers to engage with acute care settings to ensure timely follow-up. In addition, some acute care settings extend acute care encounters and actively follow-up with patients who are discharged by phone to ensure that care plans go as anticipated.

6. **Ensure the free flow of health information.** Health systems and facilities should ensure interoperable health information across settings.

7. **Continuously improve care and quality.** Providers should make it a priority to continuously improve care and quality, and monitor processes closely for ways to improve patient safety, patient experience, and patient outcomes.

4.3 Recommendations for Policymakers and Payers

The federal government can work to directly address social and environmental determinants of health through the Department of Health and Human Services (HHS) directly and through partnership with other agencies such as education, housing, labor, and other groups that can address factors that lead to acute illness and injury, and acute exacerbations of chronic illness. The ACA and MACRA have many potential levers that could be used to improve the acute care system after illness and injury occurs. Specifically the federal government can promote programs through MIPS, APMs, and PFPMs to ensure improved access to care, standardize care delivery by assessing quality and outcomes holding both patients and providers accountable, promote effective transitions in care, and ensure that providers have the information they need to make effective and cost-effective decisions. Similarly, payers have many levers to ensure improved access, standardize care, ensure smooth transitions, and increase information flow within and across settings.

1. **Enact laws to enhance prevention and reduce disparities and ensure evidence-based prevention is a priority by monitoring and incentivizing high value care.** Policymakers can implement laws that impact social determinants such as poverty, violence, food access, and those that impact public health such as promoting health behaviors. Much of this work will involve HHS and other agencies working together. In addition, there is much work that can be done within HHS through the provisions of MIPS (expanding quality measurement), APMs, and PFPMs (payment reforms). Policymakers can also create programs that improve disaster

preparedness and ensure that providers have incentives to implement evidence-based prevention efforts. Similarly payers can implement programs that focus on quality measurement and test new payment models to ensure evidence-based prevention.

2. **Align incentives for providers to meet patients' acute care needs.** Policymakers and payers can create programs, policies or laws that provide incentives to create greater access to patients, and ensure that the workforce matches patient demands. This can be achieved through MIPS (quality measurement programs) or programs that impact the healthcare workforce.

3. **Align incentives for patients to ensure cost-efficient system use**. Policymakers and payers can provide incentives to patients to promote healthy behaviors, such as paying for gym memberships, weight loss, or smoking cessation programs. Payers can also create incentives for patients to use services efficiently through insurance design (i.e., co-payments).

4. **Enhance quality measurement.** Policymakers and payers can also engage in quality improvement by working to create and promulgate a broader set of quality metrics that ensure patients get the right care, efficient care, and that information flows freely across settings. In the federal government, this can be achieved in part through MIPS, APMs, and PFPMs.

5. **Reward best practices.** Policymakers and payers can also create payment models to improve the value of acute care and incentivize the creation of patient-centered programs, such as ensuring standardization and best practice in acute care settings and structures – such as patient-centered medical homes or acute care facilities that provide greater value – that deliver timely and coordinated care. In the federal government, this can be achieved in part through MIPS, APMs, and PFPMs.

Conclusion

Through this process, our team has created a novel conceptual model of an episode of acute, unscheduled care in the United States. It describes predictors of acute illness and injury, specifically how social and individual determinants of health and the socio-environmental and public health factors in the context of individual factors, impact the likelihood of acute illness and injury. Care-decision making is an important factor that needs to be optimized in a value-based, cost-efficient healthcare system. Our model describes how people make decisions about setting choice in the context of their

own individual and community resources, along with meeting their condition-specific needs in line with their preferences. During an acute illness or injury, acute care delivery can be delivered in a variety of settings from episodic settings (i.e., EDs, urgent care clinics, or telemedicine) to longitudinal settings (i.e., doctors' offices, clinics). In addition, patients may care for themselves or rely on their community for help during an illness or injury. Along the timeframe of an episode of care, care often transitions across settings. How care transitions, specifically information transfer and communication, can be an important factor in care quality. The results of an acute care episode are its outcomes, which can be measured at the individual level (i.e., survival, experience, or symptom control) or the community-level. These outcomes in the context of financial outcomes, such as costs from a variety of perspectives (e.g., patient, society, and facility) can be combined to assess the value that was delivered during an episode. While this model does describe an episode of care across time, an important facet of the model is the feedback loops that can occur. Specifically, outcomes should feedback information to improve care delivery, care decision-making, and ultimately impact the social and individual determinants of health.

We have also identified several ways that patients, providers, and payers/policymakers can influence acute care, and specifically some examples of how federal policymakers may consider addressing some of these domains. Each stakeholder can actively engage in efforts to improve the quality and efficiency of acute care through several broad recommendations. These can serve as a general set of possible ways that quality improvement efforts can focus on improving acute care delivery in the United States.

Appendix

A1. List of Organizations Used for Recruitment

A2. Final List of Statements from Brainstorming

A3. Statement Importance by Stakeholder Group

A4. Public Comments

A1. List of Organizations Used for Recruitment

AARP
Academy Health
Advocates for EMS
America's Essential Hospitals
American Academy of Emergency Medicine
American Academy of Family Physicians
American Academy of Orthopaedic Surgeons / American Association of Orthopaedic Surgeons (AAOS)
American Academy of Pediatrics
American Association for the Surgery of Trauma
American Association of Neurological Surgeons / Congress of Neurological Surgeons
American Board of Emergency Medicine
American College of Emergency Physicians (ACEP)
American College of Osteopathic Emergency Physicians (ACOEP)
American College of Surgeons
American Heart Association
American Hospital Association (AHA)
American Medical Association
American Nurses Association
American Orthopaedic Association (AOA)
American Public Health Association (APHA)
American Trauma Society (ATS)
Association of Air Medical Services (AAMS)
Association of Critical Care Transport (ACCT)
Association of Emergency Physicians
Best Practices in Emergency Services
Consumer Health Foundation
Emergency Medical Services Labor Alliance (EMSLA)
Emergency Nurses Association
Families USA
Kaiser Family Foundation
National Association of County & City Health Officials (NACCHO)
National Association of EMS Educators (NAEMSE)
National Association of EMS Physicians (NAEMSP)
National Association of EMTs (NAEMT)
National Association of State EMS Directors (NASEMSD) - Medical Directors Council
National Association of State EMS Officials (NASEMSO)
National Collegiate Emergency Medical Services Foundation
National Medical Association
National Native American EMS Association (NNAEMSA)
National Registry of Emergency Medical Technicians (NREMT)
National Rural Health Association (NRHA)
Patient Advocate Foundation
Patient-Centered Primary Care Collaborative
Patients Like Me
Society for Academic Emergency Medicine (SAEM)
Society of Emergency Medicine Physician Assistants (SEMPA)
The Beryl Institute
Trauma Center Association of America (TCAA)

A2. Final List of Statements from Brainstorming (n=89)

Note: Highest rated statement(s) in each domain are indicated by an asterisk (*)

1. **Acute Care Infrastructure**

Item No.	Statement
8*	Having a communication infrastructure that allows acute care providers to transmit patient information across settings.
24	Need for policies to address emergency department boarding (i.e., Patients waiting in the emergency department for a bed to become available in the hospital).
62	Protection of patient health information during care transitions.
85	Hospital admission decision-making process.
87	Incentives for acute care settings to be transparent about wait times (e.g., posting wait times online in real time).

2. **Expanding Access to Care**

Item No.	Statement
2	Include providers on ambulances to treat low acuity complaints.
4	Use of non-physician providers in acute, unscheduled care.
23	Having alternative community setting for acute, unscheduled care such as urgent care or retail clinics.
32	Keeping doctor's office open longer hours, weekends, and nights.
36	The military health system and veteran health issues.
57	Ability to schedule care quickly in a primary care setting to accommodate acute, unscheduled visits.
70	Trauma care.
72	Availability of resources that do not require a visit to a facility (e.g., mobile health providers, nurse triage line, community health workers, school and work-based providers).
76	Access to pediatric specialists in acute care settings.
79*	Availability of acute care options for the mentally ill.
81	Convenient and timely access to urgent care settings.
88	Allow EMS transport of minor complaints to urgent care centers or doctor's offices instead of the emergency department.
31	Allow EMS to consider insurance status when determining a setting of care.

3. **Communicating Critical Information to Patients**

Item No.	Statement
7*	Communicating information to patients and their families about services offered (e.g., hours of operation, nurse help lines, email to physicians, etc.).
18*	Ensuring careful review and consideration of patients' current medications during and after acute care.
19	Knowing a patient's predisposition for disease based on family history.
48	Providing health, not just healthcare.

Item No.	Statement
67	Access to resources for limited English proficient patients.
78*	Providers taking patient concerns seriously and taking the time to understand them when they seek care for what may seem to be a trivial problem.

4. Post-Acute Care Coordination

Item No.	Statement
12	Provider actively guides the post-acute care plans.
13	Including family members in a patient's care following discharge from an inpatient setting.
16	Transitioning care to the palliative care setting (palliative care is comfort care given to a patient who has a serious or life-threatening disease, such as cancer, from the time of diagnosis and throughout the course of illness).
25	Access to specialty care after an emergency department or primary care visit.
54	Issues of transportation related to an unscheduled care setting.
56	Access to care and follow-up care outside the emergency department for those without health insurance or money.
58	Follow-up of clinically important findings that were not associated with the patients' original reason for seeking care.
61	Processes for transitioning care if services are not available in the current setting.
63	Home health care.
64*	Accessible/reliable follow up for post-acute unscheduled visits.
69	Provider coordination of after care.
89	Access to medication.

5. Patient Support & Decision Making

Item No.	Statement
20	How to assist family members trying to obtain an advance directive for the patient's care.
30	Patient willingness to follow treatment plans.
39*	Patient understanding of the care plan to avoid readmissions/revisits.
44	Environmental factors that influence a patients' choice of when and where to seek care.
46	Personal preferences that influence a patient's choice of when and where to seek care (e.g., ability to receive all tests in a single visit at the emergency department versus multiple appointments with primary care/specialists).
51	Ways to support patient decision making on when and where to seek acute medical care.
55	How to accommodate patients' out of town family members who come to visit.
65	Educating patients and their families about managing their medical issues.
77	Understandable discharge instructions.
80	Patient understanding of how to interpret and pay a medical bill.
84	How to empower patients and their families with the confidence to continue care at home.

6. Patient Influences

Item No.	Statement
3	Matching the sex/race/ethnicity of the provider with patient preference.
5	Cultural factors such as use of homeopathic remedies, and cultural practices for illnesses and injuries.
14	How one acute care problem often leads to more acute problems.
17*	Patient perception of the severity and urgency of the complaint as opposed to the retrospective perception of the complaint.
37	How individual behaviors such as smoking, alcohol, drug use, and participation in risky behaviors impact use of the acute care system and outcomes.
41	Prior experience with the health care system.
42	How a person's diet and nutritional status impact their health.
49	A patients' individual level of anxiety about illness and how that impacts their decision to wait for scheduled care.
71	The personal and social determinants of urgency and severity.
73	How patients' work responsibilities impact use of acute care.
74	Vulnerability as an individual-level factor.
75	Patient loyalty/trust in providers.

7. Provider Influences & Skills

Item No.	Statement
28	Provider reputation.
43	Identify specific policies that can impact cost & outcomes.
53	How to risk stratify patient populations (e.g., high risk, rising risk, low risk).
59*	Attention to overuse and over diagnosis.
66	Provider training.
68	Community education on appropriate use of the emergency department.
86*	Communication skills of the provider.

8. Public Health and Policy

Item No.	Statement
1	Preparing individuals for disasters and communities for public health emergencies.
10*	Correcting the medical record in the event of an error.
15	How medical resources can be mobilized to reach large numbers non-acute patients at public events.
22	Financial support/charity care for vulnerable patient populations.
29	Reimbursement for primary care.

Item No.	Statement
33	Different reimbursement for services depending on insurance type (e.g., private vs Medicaid).
34*	Lack of incentives for different providers to work collaboratively.
35	Malpractice.
52	How Financial incentives/disincentives impact where a patient seeks care.
83*	Notification to the public about infectious diseases outbreaks and other environmental risks.
26	Community-level factors related to legal and illegal immigration.

9. Outcome Measures

Item No.	Statement
6	Functional outcome measures (e.g., back to baseline, return to work, back to school).
9	Outcomes measures that are cross-discipline and cross the care continuum.
11	Outcomes that measure the patient experience of obtaining/getting to care (e.g., transportation, wait times, hours of operation, etc.).
21*	Outcomes that measure access to follow-up care.
27	Outcomes that can measure if the care experience was patient and family centered.
38	Outcomes that can measure cost and reimbursement at the population level.
40	Outcomes that can measure quality of life at the population level.
45	Outcomes that can measure emotional aspects of patient suffering.
47	Outcomes that measure morbidity and mortality rates on the community/population level.
50	Outcomes that measure decisions to not seek care or terminate care against medical advice.
60	Outcomes that measure health maintenance (e.g., is a patient managing their COPD and can recognize when to seek help).
82	Outcomes that recognize geographic variations (e.g., New York City versus rural Appalachia).

A3. Statement Importance by Stakeholder Group

Note: Highest rated statement(s) in each domain are indicated by an asterisk (*)

1. **Acute Care Infrastructure with Mean Rating by Stakeholder Group (1= Not Important; 6= Extremely Important)**

Item No.	Acute Care Providers (n=10)	Other Providers (n=6)	Other Stakeholders (n=10)	Patients (n=8)	All Stakeholders (n=34)
8*	5.8	5.7	5.3	5.4	5.5
24	5.5	4	5	4.4	4.8
62	4.7	4	3.6	3.9	4.1
85	5.2	3.3	4.6	4.8	4.6
87	3.7	2.2	3.4	4.1	3.5
Domain Average	**5.0**	**3.8**	**4.4**	**4.5**	**4.5**

2. **Expanding Access to Care with Mean Rating by Stakeholder Group (1= Not Important; 6= Extremely Important)**

Item No.	Acute Care Providers (n=10)	Other Providers (n=6)	Other Stakeholders (n=10)	Patients (n=8)	All Stakeholders (n=34)
2	2.5	3.3	3.8	3.1	3.2
4	4.5	5.3	5	3.9	4.6
23	4.5	5.8	5.3	5.3	5.2
31	2.2	2.7	1.8	3.4	2.5
32	5.1	5.3	4.7	4.4	4.8
36	3.5	4	3.2	5.1	3.9
57	5.3	5.8	5.6	5.1	5.4
70	4.6	3.8	4.6	4.9	4.5
72	5.1	5.5	5	4.9	5.1
76	4.6	4.8	4.2	4.3	4.5
79*	5.7	6	5.2	5.3	5.5
81	5	6	5.1	5.4	5.3
88	4.6	4.7	4.3	5.1	4.7
Domain Average	**4.4**	**4.9**	**4.4**	**4.6**	**4.5**

3. **Communicating Critical Information to Patients with Mean Rating by Stakeholder Group (1= Not Important; 6= Extremely Important)**

Item No.	Acute Care Providers (n=10)	Other Providers (n=6)	Other Stakeholders (n=10)	Patients (n=8)	All Stakeholders (n=34)
7*	5	5.7	4.9	5	5.1
18*	4.8	5.5	5	5.3	5.1
19	3.3	3.8	3.4	4.4	3.7
48	4.7	4.7	4	4.3	4.4
67	4.8	3.8	3.9	3.8	4.1
78*	5.3	4.5	5.4	4.8	5.1
Domain Average	**4.7**	**4.7**	**4.5**	**4.6**	**4.6**

4. **Post-Acute Care Coordination with Mean Rating by Stakeholder Group (1= Not Important; 6= Extremely Important)**

Item No.	Acute Care Providers (n=10)	Other Providers (n=6)	Other Stakeholders (n=10)	Patients (n=8)	All Stakeholders (n=34)
12	4.9	4.8	4.6	4.3	4.6
13	4.6	5.2	4.8	4.6	4.8
16	4.6	4.5	4.5	4.6	4.6
25	5.6	5.5	4.7	4.9	5.2
54	3.7	4	4.1	3.9	3.9
56	5.5	5.3	5.1	4.3	5.1
58	4.7	4.5	4.7	5	4.7
61	4.8	4.7	5.1	4.4	4.8
63	4.9	4.3	3.4	4.3	4.2
64*	5.8	5.2	5.6	4.8	5.4
69	5.6	4.5	4.9	4.8	5.0
89	5.2	5.5	4.4	5	5.0
Domain Average	**5.0**	**4.8**	**4.7**	**4.6**	**4.8**

5. **Patient Support and Decision Making with Mean Rating by Stakeholder Group (1= Not Important; 6= Extremely Important)**

Item No.	Acute Care Providers (n=10)	Other Providers (n=6)	Other Stakeholders (n=10)	Patients (n=8)	All Stakeholders (n=34)
20	4.6	3	3.9	4	4.0
30	5.1	6	4	4.5	4.8
39*	5.6	6	5.3	5.3	5.5
44	4.3	3.8	3.8	3.6	3.9
46	4.5	4.7	4.2	3.8	4.3
51	5	3.8	4.7	4.5	4.6
55	1.9	2	2.6	3	2.4
65	5.1	4.8	5.1	4.8	5.0
77	5.6	5.3	5.2	5.4	5.4
80	4.4	2.7	3.3	4.6	3.8
84	4.9	5	4.9	5.1	5.0
Domain Average	**4.6**	**4.3**	**4.3**	**4.4**	**4.4**

6. **Patient Influences with Mean Rating by Stakeholder Group (1= Not Important; 6= Extremely Important)**

Item No.	Acute Care Providers (n=10)	Other Providers (n=6)	Other Stakeholders (n=10)	Patients (n=8)	All Stakeholders (n=34)
3	2.5	2.3	3.4	2	2.6
5	3.3	3.3	3.5	3.8	3.5
14	3.8	2.8	4	4.6	3.9
17*	4.9	4.2	3.8	4.8	4.4
37	4.3	3.7	3.7	4.8	4.1
41	3.4	3.5	3.3	3.5	3.4
42	3.7	3.2	3.6	4.5	3.8
49	4	3.8	3.9	3.8	3.9
71	4.4	4	3.6	3.6	3.9
73	4.7	3.8	3.7	4.1	4.1
74	3.2	4	3.2	3.3	3.4
75	3.9	3.7	3.6	3.4	3.6
Domain Average	**3.8**	**3.5**	**3.6**	**3.8**	**3.7**

7. **Provider Influences & Skills with Mean Rating by Stakeholder Group (1= Not Important; 6= Extremely Important)**

Item No.	Acute Care Providers (n=10)	Other Providers (n=6)	Other Stakeholders (n=10)	Patients (n=8)	All Stakeholders (n=34)
28	2.5	3.3	2.9	3.8	3.1
43	5	4.3	4.3	4.5	4.6
53	4.3	3.5	4.3	4.8	4.3
59*	5.1	4.8	4.6	4.5	4.8
66	4.8	3.7	4.1	4.8	4.4
68	5	3.8	3.9	4.8	4.4
86*	5.3	4.5	4.2	4.9	4.8
Domain Average	**4.6**	**4.0**	**4.0**	**4.6**	**4.3**

8. **Public Health and Policy with Mean Rating by Stakeholder Group (1= Not Important; 6= Extremely Important)**

Item No.	Acute Care Providers (n=10)	Other Providers (n=6)	Other Stakeholders (n=10)	Patients (n=8)	All Stakeholders (n=34)
1	4.1	4	4.2	4.3	4.1
10*	4.4	4.8	4.6	5.1	4.7
15	3.3	4	3.2	4.5	3.7
22	4.9	4.5	4.4	4	4.5
26	3.1	3	3.6	3	3.2
29	5.2	5.7	5	5.3	5.2
33	4	3.3	2.8	4	3.5
34*	4.8	4.2	4.6	5	4.7
35	4.2	3.5	3.3	4	3.8
52	4.9	4.7	4.2	4.8	4.6
83*	4.7	4.2	4.2	5.5	4.7
Domain Average	**4.3**	**4.2**	**4.0**	**4.5**	**4.2**

9. Outcome Measures with Mean Rating by Stakeholder Group (1= Not Important; 6= Extremely Important)

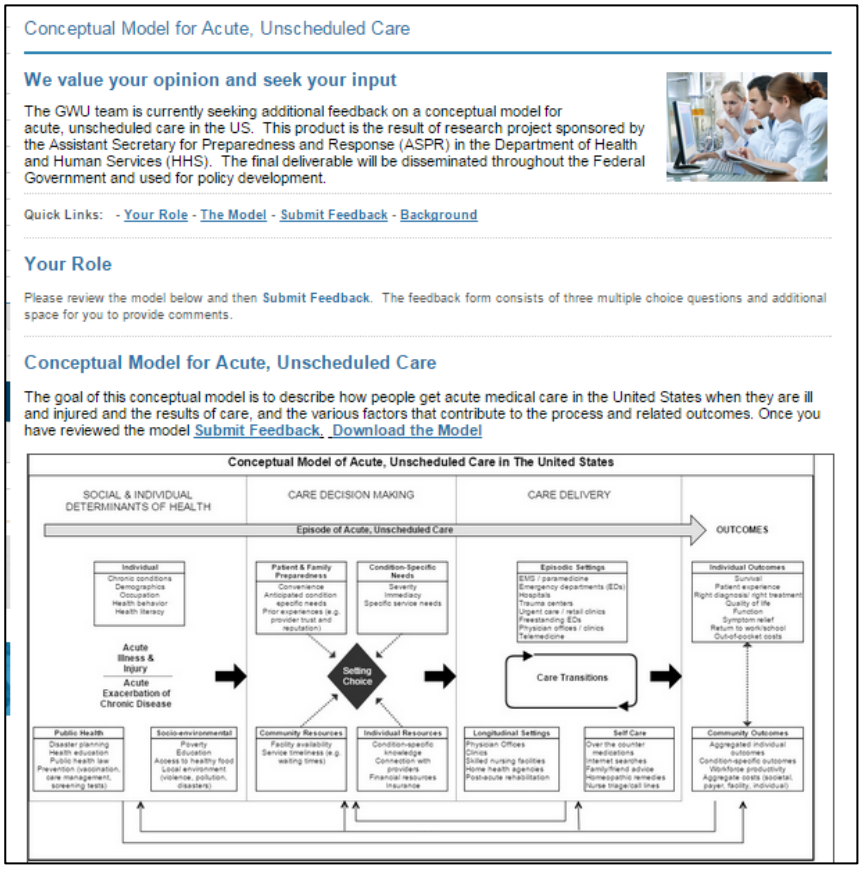
Item No.	Acute Care Providers (n=10)	Other Providers (n=6)	Other Stakeholders (n=10)	Patients (n=8)	All Stakeholders (n=34)
6	4.9	4.8	5.2	5	5.0
9	5.1	4.8	5	5.1	5.0
11	4.7	4.5	4.5	4.1	4.5
21*	5.5	5.7	5.1	4.6	5.2
27	4	4	3.9	3.3	3.8
38	4.5	4.7	4.6	4.4	4.5
40	4.3	4.7	4.2	3.8	4.2
45	3.4	3.7	3.4	4	3.6
47	4.2	4.7	4.3	4.1	4.3
50	4.1	3.5	3.6	4	3.8
60	4.9	4.8	4.3	4.3	4.6
82	4.1	3.8	4.3	4.3	4.2
Domain Average	**4.5**	**4.5**	**4.4**	**4.2**	**4.4**

A4. Public Comment

The research team solicited public comments on the revised version of the conceptual model using the Urgent Matters website and subscriber database. Urgent Matters, http://smhs.gwu.edu/urgentmatters serves as a dissemination vehicle for strategies on emergency department (ED) patient flow and quality. The subscriber database is comprised of approximately 6500 people in the emergency care community. Using an electronic form, participants were asked to review the model and respond to a short survey.

Questions:

1. Are you able to follow the main points of the model?
2. Are there any aspects of the model that are confusing or unclear?
3. Are the recommendations clear?
4. Additional comments:



Forty people responded to the request for public comment. The research team carefully reviewed all the public comments, and made additional revisions to the model (See Table A4 for a complete list of comments). These modifications included clarifications in the visual display of the model and the defining of terms used.

Note: Comments have been edited for clarity and relevance

Question	Comments
Are there any aspects of the model that are confusing or unclear?	With regards to Social & Individual Determinants of health, I had to read the Public Health section a few times to understand the concept. I believe it would be clearer if Disaster Planning was not the first topic listed. Would care transitions make more sense if it was pictured as the Setting Choice as the transition is between the episodic setting, longitudinal setting and self-care? Not sure what the lines/arrows on the bottom are supposed to communicate. Stopwatch needs to be in the picture. It starts when the patient perceives the need for care and stops when the physician walks in the room (to make hard data points that incorporate patient preferences, best practices and current quality measures.) it is clear how one arrives at setting choice but not the factors of that choice that move the person from the chosen site to an alternative site [primary provider is unavailable, urgent care is closed, no site close but for ED etc.] The whole care model is fairly complete. I did not see the prevention model of wellness, screenings, health counseling, etc., to be proactive, represented on the model. Does the model allow for populations to include tribal, military, indigenous people groups, immigrants, correctional facilities, and those who are here illegally? Does long term care (nursing homes), assisted living centers, home care agencies, hospice agencies/facilities, and dialysis clinics fall under longitudinal settings? They do provide unscheduled and scheduled health care. This is too busy, with too many rows of things that are not actually in a flow. Too many arrows. This does not show specific processes related to outcomes, they all end up in the same place. Without being tied to a specific action your chart reveals: various environments result in various outcomes. The middle row doesn't make a lot of sense to me: ""Care decision making"" column 2, determines the setting choices which should be the arrow that takes you into column 3. You don't need that middle ""setting choice"". Not sure what the Care transitions box with the arrows around it are depicting. Is this supposed to be the care ""transaction"" that is happening in each site?" Concept model looks interesting but so small here I would have found difficult to comment on had I not saved as jpeg and looked at more closely on the computer. Linkages depicted on bottom of model are confusing and would encourage some verbiage to further explain what the lines and arrows are supposed to be explaining. Unclear what unidirectional and bidirectional arrows at the bottom of the figure represent. Not sure why are uni- and others are bi-directional. Care delivery/Episodic settings - You are intermingling the setting with the provider: Setting – home, Providers - EMS/paramedicine, telemedicine, Setting - primary care (physician office/clinic/urgent care/retail clinics), Providers - Physicians/NPs/Pas, Setting - secondary care (community hospitals/EDs, freestanding EDs), Setting - tertiary care (trauma centers, hospitals,

Question	Comments
	EDs), Also need to consider differences between primary care obtained from an independent office, a local medical office owned by a hospital, and a primary care clinic within a hospital. Might be seamless to the patient, but not to payers.
Are the recommendations clear?	Yes, but not everything is going to be neat and pretty as this algorithm. Episode of Acute Unscheduled Care: Clearly outlines setting of choice that ties in with needs based on multifactorial issues, financial, connectivity with a facility, timeliness I'd like to see this in 3D. E.g., people live 24X7X365. They have perceived need for acute, unscheduled care for this same time period. How does the system meet the needs of the patient v the needs of the provider (our current system.) Yes, the recommendations, themselves are clear, but some of the assumptions maybe less so. Most providers do not even understand the cost of recommendations, let alone patients. Go to your doctor, get a recommendation of a CAT scan and then ask him what it will cost you, your insurance, the taxpayers or anyone else. I'll pay for it if you can get a clear and accurate answer! If nobody really knows the cost or the differences in costs from different facilities and providers, the entire cost issue is moot. Hard to follow what the recommendations are. Do you mean boxes at the bottom of the model that state community outcomes, self-care, etc.? Make a separate category for recommendations. I would rather see relationships for socio environmental box to decision making to outcome? Would suggest you consider in the top under Condition Specific Needs that you also include availability of specialist/subspecialist. If such is needed patient may seek care where they are available. Under section at bottom: Self Care you may want to consider adding insurance provider help lines. Some insurance companies are dictating where individual can have certain tests done for maximum coverage and to reduce out of pocket expenses. Episodic care must be more available to patients with non-emergent conditions. It is unreasonable to expect PCP offices to expand hours unless they go to a ""shift based"" model. Urgent care facilities should always be an option to patients e.g.: open 24x7. There is a huge role for EMS in triaging patients to UC's vs ED's....or...home visits/care. I could see an expanded role for properly trained EMS providers to suture uncomplicated lacerations, administer aerosol tx's etc. in patients' homes, possibly with the aid of telemedicine, portable x-ray, etc. I also see a huge role for EMS to make follow up visits to patients in their homes e.g.: patients they saw, treated, but did not transport to the ED, and/or patients transported to the ED and discharged with some reservations about how they will do at home, their support system, etc. In my career I have had the opportunity to ride along with EMS on numerous occasions. Basically, they sit at the station waiting for the emergency call...which may or may not be a real emergency. Their waiting time could be put to so much better use in the community checking in on patients that have had to access the system for whatever reason, have recently been seen in the ED, or have recently been discharged from the hospital in-patient setting. EMS is a huge untapped resource to help insure that only those patients who need the services of the ED are transported there.
Additional Comments:	Provides a concise picture of the care of the patient. You missed mental health. Acute care usually has some mental health dx attached. I.e. depression nos etc... Need education for chronic conditions and preventative model with objectives and goals to obtain.

Question	Comments
	This will help educate individuals on their best options regarding care specific care related to current condition Media influence is also a driving force for decision making. I think that the references to EMS are too limited. Mobile Integrated Healthcare initiatives such as those at MedStar in Ft. Worth and REMSA in Reno are currently returning huge savings and producing great care. Both programs proactively divert some patients into more cost effective environments and are very effective at readmission avoidance. These systems function in the Care Decision Making portion of your model. In these cases, the systems actually measure the costs of each option and guide decision making using that data. The model may suggest that all contributing factors are equal but I suspect that access may be a stronger driver than individual, socioeconomic, community, or individual resources. We have far too much unscheduled care and are in great need of more prevention, health screening, wellness, and proactive health care. If you are just capturing the various types of choices that lead to various outcomes, that is achieved. All the extra lines/arrows are not necessary. Personally I like to see a goal, so I would want more from the outcomes. Quick comments from a public health perspective - include disparities/health inequities under Socio-Environmental determinants of health. Consider under Public Health to include Health Promotion with Health Education (support for community wellness impacts chronic disease) There are a lot of elements condensed to a small "linear" event. It would be nice to see acute illness vs. acute exacerbation of chronic condition differentiated and then have those gauged against individual knowledge vs. public health initiatives. Also there should be differentiation of "disaster" or "state of emergency" vs a normal period in time Missing GEOGRAPHIC access factors - setting choice is greatly influenced by the ability to physically access a care facility. Suggest this go under Socio-environmental and/or Individual Resources. I do see Facility Availability under Community Resources, but what good is a local facility when you don’t drive and are wheelchair-bound? homeopathy is mentioned but not other non-allopathic / osteopathic alternate / non-traditional care (chiropractic / acupuncture / etc.) may not need to be specified I would like to suggest that the paper include a glossary of the various terms in the paper. I believe that this streamline the text and enable the reader to focus on the recommendations. I suggest putting a box of ""financial outcomes"" separate from the individual and societal outcomes. I believe that this requires more emphasis. You might also put health and finance outcomes as subsets of individual and financial. this can emphasize the tension between health and finance more clearly. You can interpose the word value in between the health and finance outcomes." Mental health history plays a significant role in healthcare utilization, and should be added to the individual determinants. The vast majority of care choices and delivery is self-care and its seems like the model should somehow reflect the overwhelming preponderance of those decisions compared to the other care settings and providers involved. "

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