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## Emergency Medicine and Hospital Care in the Home and Community

The unsustainable course of healthcare spending in the US has driven insurers to reward higher-quality, lower-cost care through value-based reimbursement agreements.<sup>1</sup> Providers are incentivized to keep patients well enough that they do not need to visit the emergency department (ED) or be admitted to the hospital. They are also incentivized to prevent hospital readmissions and ED bouncebacks of their patients.<sup>2</sup> The predominant contributing factors to readmissions and bouncebacks are little or no after-hour access to the care team and the lack of coordinated follow-up care after patients are discharged. Evidence shows that providing both acute and hospital-level care in the home and community can prevent or significantly lower the rates of hospital admissions, readmissions, emergency visits, and bouncebacks, resulting in better health outcomes, higher levels of patient satisfaction, and lower costs.

### Emergency Department

The rapidly declining number of primary care physicians and geriatricians, combined with limited same-day and after-hour access, often makes the ED the only option for older people when they have a

health need. Older adults use emergency care more than any other cohort and collectively make over 20 million ED visits annually in the US,<sup>3,4</sup> accounting for 15 percent of all ED visits.<sup>5</sup> Overcrowding in the ED is already a cause for concern around the world<sup>6,7,8</sup> and can contribute to poor medical outcomes including delays in treatment and diagnosis and adverse health events.<sup>9,10,11,12</sup> Without new systems to provide emergency care to the older population, overcrowding will only become worse because ED usage increases with age<sup>13</sup> and the oldest old is the fastest growing age group in the world.<sup>14,15</sup> From 2010 to 2050, the number of those 85 and older in the US is expected to more than triple<sup>16</sup> and, by 2060, will represent one fourth of the population.<sup>17</sup>

## Cost

One in five people in the US visit the ED annually.<sup>18</sup> The New England Healthcare Institute claims that unnecessary use of the ED is responsible for US\$38 billion in annual healthcare costs.<sup>19</sup> An estimated 30 to 37 percent of all ED visits are considered nonurgent, meaning the patient could delay seeing a clinician for several hours without their health concern becoming worse.<sup>20</sup> Estimates show that over 30 percent of Medicare beneficiaries who visit the ED, and are not admitted to the hospital, could have been treated effectively in other settings.<sup>21</sup> Nearly one half of the residents in long-term care visit the ED annually, and most of those visits are considered avoidable.<sup>22</sup> From 2005 to 2010, nursing home residents made, on average, 1.8 ED visits annually in the US.<sup>23</sup> In 2005, unnecessary ED visits of nursing home residents insured by Medicare or Medicaid resulted in 314,000 possibly avoidable hospitalizations costing an estimated US\$2.6 billion.<sup>24</sup> Care in the ED is far more expensive than care in the ambulatory setting. One study estimated that if nonurgent cases were treated in urgent care centers or retail clinics, the health system would realize US\$4.4 billion in cost savings annually.<sup>25</sup>

## Risk for Older Adults

Emergency clinicians are rarely trained nor are they equipped to dedicate the additional time required to treat frail people with injuries and multiple chronic conditions. Emergency doctors quickly cure or treat episodic health events. Older adults are especially susceptible to adverse health events<sup>26</sup> resulting from hospitalizations and emergency department visits.<sup>27,28</sup> They are at a higher risk of falling, developing infections, and experiencing dangerous medication interactions, missed diagnoses, and delirium.<sup>29</sup> To combat this risk and provide better care for older adults, some hospitals have added geriatric emergency departments. The first was built in 2008 in New Jersey and today, there are approximately 100 in the US.<sup>30</sup>

## Cognitive Impairment in the ED

Those with cognitive impairment are at even greater risk for poor health outcomes in the ED.<sup>31</sup> Although 25 to 40 percent of older people who visit the ED have some form of cognitive impairment, it often goes undiagnosed.<sup>32,33,34</sup> Some estimates suggest that ED clinicians miss delirium 75 percent of the time and dementia 86.6 percent of the time.<sup>35</sup> This opens the door to medical error because patients are not able to provide an accurate medical history or description of their present health issue.<sup>36</sup> It also can contribute to inefficient, dangerous discharges because the patient might not be able understand the discharge instructions. These patients are likely to bounce back to the ED for the same health concern.

## Hospital

### Hospitalizations

People 65 and older use the hospital more than any other cohort. They account for 43 percent of hospital admissions in the US.<sup>37</sup>

Inpatient hospital services represent 23 percent of Medicare costs.<sup>38</sup> Medicare beneficiaries account for 46 percent of the aggregate hospital costs and 36 percent of the aggregate hospital stays.<sup>39</sup>

## Readmission Costs

The cost of readmissions for Medicare patients alone is US\$26 billion annually, and US\$17 billion of that cost would not have occurred had the patient received the proper care during the first admission.<sup>40</sup> Twenty percent of older patients are readmitted to the hospital within a month of discharge.<sup>41</sup>

## Risk for Older Adults

One in three Americans age 65 and older are living with multiple chronic conditions.<sup>42</sup> The rates of comorbidities increase with age and, as we mentioned above, the oldest old represent the fastest growing population in the world. They are often frail with complex care needs and are more susceptible to adverse health events, including falls, infections, medication mismanagement, and medical error in the hospital and after discharge.<sup>43</sup> These events can lead to longer hospital stays and possibly result in death.

## Cognitive Impairment in the Hospital

Patients who are admitted to the hospital after spending longer than 10 hours in the ED are at a higher risk of delirium.<sup>44</sup> The prevalence of delirium in the community is one to two percent, while 14 to 56 percent of hospitalized older patients experience it.<sup>45</sup> Delirium can lead to functional decline, loss of independence, and eventually death.<sup>46</sup> Patients who have dementia are three to five times more likely than others to develop delirium during and after a 30-day hospital stay and after the stay. Episodes of delirium have shown to accelerate the rate of cognitive decline in patients with dementia.<sup>47</sup>

Hospitalization-associated disability (HAD) is the decreased ability to perform the activities of daily living at the time of discharge as compared to the baseline before admission.<sup>48</sup> HAD is the main cause of functional decline for older patients. More than 30 percent of patients over 70 experience HAD after being hospitalized for an acute illness.<sup>49,50</sup>

For every degree of increased dementia severity, as measured on the Global Deterioration Scale,<sup>51</sup> patients are 1.5 times more likely to experience delirium. Patients with dementia see longer hospitalization stays if they develop delirium<sup>52</sup> and are 25 percent less likely to have a full recovery from delirium than patients without dementia.<sup>53</sup>

The literature and demonstration projects suggest that it is important to design systems that can support the ability to treat people, especially older adults, in the home and community and keep them out of the hospital and ED whenever possible. One model of emergency care in the home and community that is receiving traction worldwide is paramedicine. Today there are paramedicine programs operational in approximately 20 states in the US.<sup>54</sup> We will share two examples of excellence.

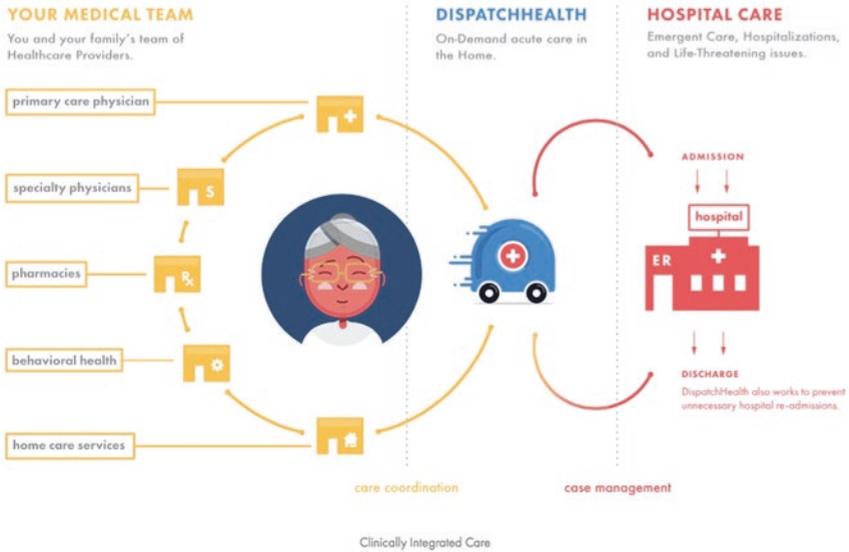
We are an evolutionary extension of the emergency department. (Mark Prather)

*Dr. Mark Prather and Kevin Riddleberger, DispatchHealth*

Mark Prather is the Chief Executive Officer and Kevin Riddleberger is the Chief Strategy Officer of Colorado-based DispatchHealth. Dispatch Health provides acute healthcare in homes, offices, retirement communities, and skilled nursing facilities.<sup>55</sup> The DispatchHealth leadership is comprised of technology innovators and seasoned emergency medical clinicians. Over 60 percent of their patients are 65 and older and are insured by Medicare, Medicaid, or Medicare Advantage health plans.

When a person requests medical care for an acute medical condition with DispatchHealth via phone, website or mobile app, they are connected with a DispatchHealth clinician to triage the call. During the ini-

tial call, the DispatchHealth clinicians gather further information about the patient and their acute medical condition to determine whether the person can be treated safely at home or their place of employment. If the person can be treated at home or work, a DispatchHealth team is deployed. If the person needs hospital care, they send an ambulance.



Source: DispatchHealth

Documenting impediments to care is a new level of care coordination.  
(Mark Prather)

The DispatchHealth team has a higher level of clinical capabilities than most urgent care centers. The care team includes an emergency medical technician and an emergency department-trained board-certified nurse practitioner or a physician assistant. The average length of the DispatchHealth home or office visit is just under an hour. This is notable because rarely, if ever, does a medical team in the ED have almost an hour to spend with one patient. During and after the visit,

communication is established and coordination of care is performed with the patient's existing primary care or specialty care medical team. DispatchHealth clinicians also perform a social determinants of health assessment of the patient's home to identify other potential health risks or impediments to care including: lack of access to transportation for follow-up care, fall hazards, medication management issues, access to food, ability to perform activities of daily living, and availability of social support. The team shares this information with the primary care team and or care coordinators so they can connect the patient to necessary social supports to prevent readmissions or bounce-backs and improve the patient's ongoing health. This preventative benefit is only possible because the care team is in the patient's home.

Thirty to forty percent of what used to be done in the hospital can be done in the home for a fraction of the cost. (Mark Prather)

A home or office visit from the DispatchHealth team is approximately eight to ten times less expensive than a visit to the ED. These cost savings caught the attention of public and private insurers who reimburse DispatchHealth to serve their beneficiaries. DispatchHealth now operates in seven markets across the country and works with large commercial, Managed Medicaid and Medicare Advantage plans to be an in-network provider in the markets it offers medical services. Those insurers include Medicare, Medicaid, Tricare, Anthem, Blue Cross Blue Shield, United Healthcare, Aetna, Humana, and Cigna.

Our goal is to produce outcome-based medicine, not more medicine. We do not need more care, we need integrated care. (Mark Prather)

### **Care Coordination Across the Continuum**

Mark and Kevin described the ability of the DispatchHealth team to access patient electronic medical records through the health information exchange. When DispatchHealth clinicians visit a patient, they have full knowledge of their health profile and current medications.

After providing care, the medical team updates the health profile in real time so the primary care doctor. The rest of the patient's medical team has the same up-to-date information. The exchange also enables DispatchHealth to follow their patients' progress by monitoring the activity on the exchange to determine whether a patient bounces back to the ED with a similar health concern. This an important quality measure used by DispatchHealth.

If we are going to create a better system, we need to eliminate redundant care. (Mark Prather)

### **Bounceback Rates**

The newer reimbursement policy in the US rewards higher value and better outcomes. Bouncebacks are expensive and cause patient suffering. They also imply that the care or follow-up care was not adequate during the first health event. Each patient visited by the DispatchHealth team receives a phone checkup three days after treatment. Mark mentioned that the national average bounceback rate for emergency departments is one in five or 20 percent. The bounceback rate for DispatchHealth patients is 6 percent. This represents an exponential savings for insurers because the cost for the initial visit is eight to ten times lower and avoiding a bounceback is 100 percent savings of a follow-up ED visit, hospitalization, and possibly an ambulance charge. Receiving coordinated care and avoiding an ED visit and bounceback also contribute substantially to patient satisfaction and well-being.

### **Patient Satisfaction**

Patient satisfaction is a quality measure that is becoming ever more important because it is the core of patient-centered care. DispatchHealth uses the Net Promoter Score to measure patient satisfaction. Their score ranges from 93 to 95 as compared to the industry average score of 30.



We have flipped the model of access to acute care. (Kevin Riddleberger)

## Access

Another quality measure that is receiving much attention because of the high rates of ED usage is access to same-day or after-hour care. DispatchHealth services are available to patients every day of the week from 8 am to 10 pm. DispatchHealth care is also more accessible because patients do not have to leave their homes and wait in an emergency department for treatment.

## Senior Living Communities

DispatchHealth has developed partnerships with home health agencies, senior living communities, primary care providers, specialty practices, hospice and palliative care providers, nurse advice lines, EMS agencies, and health systems. In 2017, DispatchHealth completed 6834 patient visits to individuals aged 65 and older. Of these visits, only 8 percent were transferred to the hospital. The estimated cost savings from these

patients avoiding usage of the 911 system and the ED in 2017 was US\$12.6 million. The estimates do not take into account the thousands of avoidable hospitalizations that DispatchHealth likely prevented. DispatchHealth is projected to produce well over US\$20 million in cost savings in 2017. As DispatchHealth continues to grow and move into new markets, we can only imagine the cost savings will continue to grow as well.

The beneficial outcomes are not only financial. The well-being of older adults who avoid the physical and emotional strain of the ambulance, ED, and possibly hospital admission cannot be underestimated. Additionally, home health agencies are rewarded with better CMS star ratings<sup>56</sup> for lowering their rates of unplanned ED visits or hospitalizations.

Kevin and Mark identified the healthcare issues prevalent today that DispatchHealth is positioned to address. They include:

- 4.4 billion Medicare dollars are wasted in unnecessary emergency care annually;
- 37 percent of emergency department visits are estimated to be unnecessary;
- Over 4 billion dollars are spent each year on potentially avoidable ED visits and hospital admissions by residents in long-term care;
- Medicaid expansion contributed to a 40 percent increase in emergency department visits;
- The US health system is in need of 50,000 more primary care physicians;
- 17–25 percent of 911 transports are unnecessary or inappropriate.

Since the interview with Kevin and Mark, DispatchHealth has continued to expand its services across the country. It now operates in Denver, CO; Colorado Springs, CO; Phoenix, Arizona; Richmond, Virginia; Las Vegas, Nevada; Houston, TX; and Oklahoma City, OK. They plan to be in 10 markets by the end of 2018 with projections to see over 50,000 patients and save the healthcare delivery system over US\$80 million in unnecessary ambulance trips, ED visits, and hospitalizations.

Another community paramedicine program that has shown to reduce ED visits dramatically is based out of Northwell Health in Long Island, New York.

*Dr. Kristofer Smith, Northwell Health Solutions*

Kristofer Smith is the Senior Vice President of the Office of Population Health Management and the Medical Director for Northwell Health Solutions, the largest integrated health delivery system in New York State. He is also an Associate Professor in the Department of Medicine at the Hofstra Northwell School of Medicine.

We detailed the house calls or home-based palliative care program of Northwell Health in Chap. 3. Northwell Health trained a clinical team to use their large fleet of ambulances to serve patients in the house calls program. When a patient or family member calls for urgent care, the health situation is triaged. If there is a need to escalate care, a doctor is called to determine if the person can be treated at home. If the patient is treated at home, the average arrival time for the care team is 23 minutes. The paramedicine team contacts the doctor with the initial evaluation results and the team determines the next course of action together.

At the time of his interview, Kristofer Smith noted that they had conducted more than 1100 paramedicine visits in 2.5 years. In those years, 77 percent of the patients were treated at home as compared the industry average of less than 10 percent. A patient survey revealed that, without the paramedicine service, 86 percent of the patients would have gone to the ED. In that period, Northwell Health realized an estimated US\$3.8 million of cost savings by avoiding ED visits, ambulance transports, and hospital admissions.

## **Late Life Planning**

The Northwell Health paramedicine program is unique because it is part of the care continuum for existing older patients with multiple chronic conditions. This means that the urgent care team is aware of the patients' individual preferences and goals for care and are able to honor those preferences. If a typical ambulance in another town visits a frail older patient, they will likely bring the person to the hospital where he or she

will likely receive invasive, extensive, and costly care. The older individual may not even want such care if asked. The emergency medical technicians would not know that possibly the patient would prefer to remain at home and be kept comfortable and out of pain. Honoring the care goals and priorities of the patient is another important measure of patient-centeredness.

## **Barriers to Implementation**

The main barriers to implementation of acute care in the home include reimbursements that do not pay for the services, difficulty in reorganizing existing health systems, and changing the stakeholder and institutional view of where emergency medicine is best delivered. Home can be defined as the place where a person resides, which includes retirement communities and skilled nursing facilities.

## **Acute Care Delivery in Skilled Nursing Homes**

One half of nursing home hospitalizations have been deemed unnecessary,<sup>57</sup> including hospitalizations that occurred in the last year of life.<sup>58</sup> The health system costs and detrimental effects of these hospitalizations on the patient's quality of life are dramatic.

As of 2000, an estimated 70 percent of nursing home residents were living with cognitive impairment (CI).<sup>59</sup> Because the incidence increases with age, as the oldest old population grows, so will the number of nursing home residents with CI. Those residents are more likely to experience a preventable ED visit and hospitalizations.<sup>60,61</sup>

The innovation behind Call9 is straight forward: Why take a nursing home resident to the hospital when you really do not have to? (Timothy Peck)

*Dr. Timothy Peck, XiaoSong Mu, and Garrett Gleeson, Call9*

Timothy Peck and XiaoSong Mu are the founders of [Call9](#). Timothy Peck was a former emergency department doctor who, with a technologically

sophisticated team, built Call9 to fill the gap between care in the emergency department and the nursing home. Call9 provides around-the-clock acute and follow-up care in skilled nursing homes. This enables the residents to avoid a visit to the ED and risk being hospitalized. They also provide palliative care. As we have detailed in Chap. 4, without access to palliative and hospice care, patients are forced into what some refer to as “assault and battery care” (the cycle from ED, to hospital, and back to skilled nursing) throughout the last years of life. This cycle is costly and causes patient suffering, often without any beneficial health outcomes. To our knowledge there is no other provider of around-the-clock emergency care delivered in nursing homes in the US.

I wanted to find a way to fill the need gap between nursing home care and emergency care that was more patient centered, had better outcomes, and was less costly. (Timothy Peck)

## **Why Nursing Home Residents Are Sent to the ED**

Timothy spent time living in a nursing home to understand why residents were sent to the emergency department. He boiled down the issue to three main contributing factors:

- The nurse-to-patient ratio (at best, 1 to 20) does not give nurses the time to attend to acute medical events;
- The nursing home staff does not have the diagnostic capabilities needed for acute care;
- Physicians and other high-level clinicians are not available after hours.

## **How the Call9 Model Works**

Call9 places emergency and geriatric-trained clinical care specialists in nursing homes around the clock. The specialists are trained on a continuing basis in a skill set that is different from a nurse, and that has a geriatric component. When a patient in one of the skilled nursing homes that Call9 serves has an adverse health event, the Call9 clinical specialist is at

the bedside within minutes. This is in contrast to the other option of waiting for an ambulance, traveling to the ED, and waiting in line at the, often over crowded, ED for care. The specialist immediately begins a series of diagnostic tests and contacts the emergency physician who is available around the clock virtually. All of the electronic medical records, patient workflow, telemetry, and lab and diagnostic results are uploaded in real time online to the patient dashboard that the physician has on his or her screen. Together the physician, via tablet, and specialists determine whether the patient can be treated at home or should be transported to the ED.

### **Follow-Up Care**

The Call9 team provides follow-up care for their patients that usually lasts two to three days or longer if the situation warrants. Internal medical physicians oversee the follow-up care that is also tracked in detail by the clinical care specialist via technology.

We have embedded a light model of an emergency department in the nursing homes we serve. (Timothy Peck)

## **Honoring the Care Priorities and Advanced Directives**

Call9 clinical care specialists maintain close and ongoing relationships with the residents and their families. Together they build a late life care plan that is centered around the well-being and priorities of the resident. The specialists maintain a continued presence throughout the care continuum from palliative to hospice care. This coordinated, person-centric model enables people to be at home and not in the hospital when they die.

In his interview, Timothy shared an example of how a patient was able to die with dignity at home (in the nursing home) with her husband by her side. During a teleconference, one of their physicians explained to the husband that his wife was likely to die soon. After the husband's initial

shock and fear, he made the choice to spend their remaining time together in the nursing home rather than going to the hospital. It was the couple's 65th wedding anniversary. They spent their remaining time quietly together until she passed away. In itself this story represents patient-centered care at its best because the goals of the patient and the family override heroic medical interventions.

An unseen aspect of the above case is how these moments affect the team of Call9. Engineers who design the complex technology behind the scenes are privy to the human aspect of their mission that can facilitate dignity in death for their patients and peace and comfort for their families. These situations also are more fulfilling to physicians and the rest of the care team who have built caring relationships with their patients and families.

## Population Health Data

Call9 is capturing extensive data on patients experiencing an acute health event. This aggregated specialized data could prove useful in population health management in the future and is used to direct the Call9 practices and resource allocation.

Eighty percent of the patients we see would still go to the emergency department if we did not keep treating them after the original event.  
(Timothy Peck)

## Clinical and Cost Outcomes

The Call9 business model is built on providing value-based care. Call9 is reimbursed mostly by the savings to the insurer. Call9 has reimbursement arrangements with most of the large insurers in the area they serve. Eighty percent of the residents seen by Call9 avoid transport to the ED and potential subsequent hospitalization. An independent economics firm reviewed the Call9 outcome data and determined that based on hospital avoidance, Call9 was saving each nursing home eight million dollars per year.

Another program that addresses the concerns of insurers who are focused on reducing the number of hospitalizations and the resulting cost and subpar health outcomes is the one that delivers hospital-level care in the home. Hospital at Home and “Hospital in the Home” programs are operational in Australia, the United Kingdom, Italy, New Zealand, and Israel. In the US, Hospital at Home services are available in:

- Some Veterans Affairs Medical Centers;
- Presbyterian Health Services in Albuquerque, New Mexico;
- Cedars Sinai Medical Center in Los Angeles, California;
- Geisinger Health Systems Cleveland Clinic in Cleveland, Ohio;
- Brigham and Woman’s Hospital in Boston, Massachusetts, and
- Mt. Sinai in Toronto Canada.

Mount Sinai in New York is conducting a CMS Innovation demonstration project of Hospital at Home through the Icahn School of Medicine in New York.<sup>62</sup> The project will collect data from the demonstration with the goal of making Hospital as Home a reimbursable service through a bundled payment agreement.<sup>63</sup>

Hospital care at home has shown to reduce mortality and readmission rates, improve patient and family satisfaction, and result in shorter length of stays and fewer complications at a lower cost.<sup>64,65</sup>

I see the hospital of the future as one large intensive care unit that provides high tech procedures. All other care should be provided outside of the hospital setting. (Dr. Bruce Leff)

## **Dr. Bruce Leff, Hospital at Home**

Bruce Leff is a professor of medicine at the Johns Hopkins University School of Medicine where he directs the Center for Transformative Geriatric Research.

Hospital at Home is a 20-year evidence-based project of Bruce and his team at the John Hopkins University School of Medicine. Hospital at Home care begins when a person arrives at the emergency department.

The clinical team conducts an assessment using the checklist of criterion to determine whether a patient qualifies for hospital care at home. The criterion also helps to identify frail older patients who are more likely to decompensate in the hospital setting.

Physicians and nurses visit the patients at varying rates depending on the need. The most common diagnoses of patients treated at home include pneumonia, reoccurring congestive heart failure, deep vein thrombosis, cellulitis, pulmonary embolism, urinary tract infection, nausea, vomiting, and dehydration.

Bruce explained that Hospital at Home can be adapted to other forms of care in the home. Mount Sinai is considering moving subacute rehabilitation into the home when appropriate as a result of the shortage of skilled nursing hospital beds in Manhattan. It is a win-win proposition because patients want care in the home and the provider realizes cost savings. Bruce expects that, going forward as care and reimbursements become less siloed, Hospital at Home will be adapted to other areas of care.

If you are responsible for the total bill of healthcare and you own all the assets of healthcare, keeping people out of the hospitals makes good economic sense.

## Cost

Bruce described that single-payer systems<sup>66</sup> and managed care organizations<sup>67</sup> have inherent economic incentives to provide high-quality care at a lower cost because they are the payer and the payee. These incentives lead to the early proliferation of Hospital at Home beginning with managed care organizations and the Veterans Administration. Bruce noted that Hospital at Home costs 20 to 30 percent less than a hospitalization and results in significantly better health outcomes including shorter hospital stays, fewer lab and diagnostic tests, and slightly lower hospital readmission and mortality rates. Today's evolving reimbursement landscape, which emphasizes value, promises to drive more systemic uptake by hospitals in the US.

Providing hospital care at home also includes avoiding the societal costs of building new hospitals in countries with government-funded healthcare. Bruce explained that it costs approximately US\$2 million to capitalize one hospital bed, which means that a 500-bed hospital costs approximately US\$1 billion for the building alone.

Hospital at Home is patient-centric, community-based care.

## **Patient Satisfaction**

The Hospital at Home team conducted studies to explore peoples' feelings about receiving hospital care at home. The feedback was positive—even people in their late 90s reported that they prefer to receive care at home when possible. Bruce noted poor communication is the main driver of malpractice lawsuits. He also noted that having a care team visit the home and meet with the family forms a more person-centered relationship with better communication. Patients and their families report a higher satisfaction level with such individualized care.

There is still a dominant bias toward facility-based care.

## **Barriers to Implementation**

Reimbursements still remain a barrier to implementation of Hospital at Home. Possibly the CMS innovation demonstrations will make Hospital at Home reimbursable in the future. Since our interview, Bruce mentioned that the Hospital at Home had submitted a proposal to the Physician-Focused Payment Model Technical Advisory Committee<sup>68</sup> (PTAC) to recommend that CMS reimburse for Hospital at Home. We sincerely hope that will happen.

Changing long-standing beliefs and habits remains an additional barrier to Hospital at Home, Dispatch Health, Northwell Health, and Call9. For years facility-based care has been considered the gold standard and the only safe option by providers and patients alike. We hope that time,

reimbursement policy, and evidence will challenge those beliefs and expand to include emergency care in the home—wherever home may be.

Our next chapter is about supporting those with dementia and their caregivers. We write about an intervention that enables caregivers of a person with dementia to keep their loved one at home for, on average, one year longer. We also write about other programs that support the well-being of caregivers and those with dementia for whom they care. The need to support caregivers cannot be underestimated. Caregivers are often referred to as the silent army—without formal and informal caregivers, the global burden of supporting the aging population would become nothing short of a crisis.

The full interviews referenced in this chapter can be found at this link: [www.accessh.org/agingwell](http://www.accessh.org/agingwell).

## Notes

1. Value-based reimbursement details can be found in Chap. 1.
2. Bouncebacks are when a patient returns to the ED with the same health issue within 30 days.
3. Blunt, I., Bardsley, M. & Dixon (2010). Trends in emergency admissions in England 2004–2009. Research report. Nuffield Trust.
4. Ostir, G., Schenkel, S.M., Berges, I.M., Kostelec, T., & Pimetel, L. (2016). Cognitive health and risk of ED revisit in underserved older adults. *Journal of Emergency Medicine*, 34(10), 1973–1976.
5. Garland, S.B., (2017). An emergency department designed for older patients. *Chicago Tribune*, March 1.
6. Erenler, A.K., Akbulut, S., Guzel, M., Cetinkaya, H., Karaca, A., Turkoz, B., & Baydin, A. (2014). Reasons for overcrowding in the emergency department. Experience and suggestions of an education and research hospital. *Turkish Journal of American Medicine*, 14(2), 59–63.
7. Di Somma, S., Paladino, L., Vaughn, L. Lalle, I., Magrini, L., Magrini, M. (2015). Overcrowding in emergency department: An international issue. *Internal and Emergency Medicine*. 19(2), 171–175.
8. Boyle, A., Abel, G., Rout, P., Dhakshinamoorthy, V., Ayyamuthu, R., & Burton, J. (2015). Comparison of the international crowding measure in emergency departments (ICMED) and the national emergency depart-

- ment overcrowding score (NEDOCS) to measure emergency department crowding: Pilot study. *Emergency Medicine Journal*, 33(5), 307.
9. Derlet, R.W., & Richards, J.R. (2002). Emergency department overcrowding in Florida, New York, and Texas. *Southern Medical Journal*, 95(8).
  10. Derlet, R., (2002). Overcrowding in emergency departments: Increased demand and decreased capacity. *Annals of Emergency Medicine*, 39(4), 430–432.
  11. Lee, C., Lee, N., Chuang, M., Chen, P., Chang, C., & Ko, W. (2012). The impact of overcrowding on the bacterial contamination of blood cultures in the ED. *The American Journal of Emergency Medicine*, 30(6), 839–845.
  12. Ackroyd-Stolarz, S., Guernsey, R., MacKinnon, N.J., & Kovacs, G. (2011). The association between a prolonged stay in the emergency department and adverse events in older patients admitted to hospital: A retrospective cohort study. *British Medical Journal Quality & Safety*, 20(7), 564.
  13. Latham, L.P., & Ackroyd-Stolarz, S. (2014). Emergency department utilization by older adults: A descriptive study. *Canadian Geriatrics Journal*, 17(4), 118–125.
  14. UN.org. World Population Aging 1950–2050. Chapter IV. <http://www.un.org/esa/population/publications/worldageing19502050/>. Accessed June 2017.
  15. National Institute on Aging. Why population aging matters: A global prospective. Trend 3: Rising numbers of the oldest old. <https://www.nia.nih.gov/publication/why-population-aging-matters-global-perspective/trend-3-rising-numbers-oldest-old>. Accessed June 2017.
  16. Hwang, U., Shah, M.N., Han, J.H., Carpenter, C.R., Siu, A.L., & Adams, J.G. (2013). Transforming emergency care for older adults. *Health Affairs*, 32(12), 2116–2121.
  17. US Census Bureau. <https://www.census.gov/newsroom/facts-for-features/2015/cb15-ff09.html>. Accessed June 2017.
  18. Obermeyer, Z., Cohn, B., Wilson, M., Jena, A.B., & Cutler, D.M. (2017). Early Jeff after discharge from the emergency department: Analysis of national insurance claims data. *BMJ*, 356: j239.
  19. NEHI (2010). A Matter of urgency: Reducing emergency department overuse. <http://www.nehi.net/publications/6-a-matter-of-urgency-reducing-emergency-department-overuse/view>. Accessed June 2017.

20. Uscher-Pines, L., Pines, J., Kellermann, A., Gillen, E., & Mehrotra, A. (2013). Emergency department visits for nonurgent conditions: Systematic literature review. *American Journal of Managed Care*, 19(1), 47–59.
21. Abrashkin, K.A., Washko, J., Zhang, J., Poku, A., Kim, H., & Smith, K. Providing acute care at home: Community paramedics enhance an advanced illness management program—Preliminary data. *Journal of the American Geriatrics Society*, 64(12), 2572–2576.
22. LaMantia, M.A., Lane, K.A., Tu, W., Carnahan, J.L., Messina, F., & Unroe, K.T. (2016). Patterns of emergency department use among long-stay nursing home residents with differing levels of dementia severity. *The Journal of Post-Acute and Long-Term Care*, 17(6), 541–546.
23. Burke, R.E., Rooks, S.P., Levy, C., Schwartz, R., & Ginde, A.A. (2016). Identifying potentially preventable emergency department visits by nursing home residents in the US. *Journal of the American Medical Directors Association*, 14(5), 395–399.
24. Ibid.
25. Weinick, R. M., Burns, R. M., & Mehrotra, A. (2010). Many emergency department visits could be managed at urgent care centers and retail clinics. *Health Affairs*, 29(9), 1630–6.
26. An adverse health event is an unintentional injury incurred because of medical mismanagement or error that results in death, severe illness, hospital admission, lengthened hospital stay, or disability (Szejf et al., 2012).
27. Han, J.H., Bryce, S.N., Ely, W.E., Kripalani, S., Morandi, A., Shantani, A., Jackson, J.C., Storrow, A.B., Dittus, R.S., & Schnelle, J. (2009). The effect of cognitive impairment on the accuracy of the presenting complaint and discharge instruction comprehension in older emergency department patients. *Annals of Emergency Medicine*, 57(6), 662–671.
28. Martin-Kahn, M., Burkett, E., Schnitker, L., Jones, R.N., & Gray L.C. (2013). Methodology for developing quality indicators for the care of older people in the emergency department. *BMC Emergency Medicine*, 13(1).
29. Gorman, A., (2016). Geriatric ERs reduce stress, medical risks for elderly patients. *Kaiser Health News*.
30. Ibid.
31. Schnitker, L.M., Martin-Kahn, M., Burkett, E., Beattie, E., Gray, L.C. (2013). Appraisal of the quality of care of older adults with cognitive

- impairment in the emergency department. *Journal of Gerontological Nursing*, 39(3), 340-40.
32. Carpenter, C.R., Bassett, E.R., Fisher, G.M., Shirshekan, J., Galvin, J.E., & Morris, J.C. (2011). Four sensitive screening tools to detect cognitive dysfunction in geriatric emergency department patients: Brief Alzheimer's screen, Short Blessed test, Ottawa 3DY, and the caregiver-completed AD8. *Academic Emergency Medicine*, 18(4), 374.
  33. Hustey, F.M., Meldon, S.W., Smith, M.D., & Lex, C.K. (2003). The effect of mental status screening on the care of elderly emergency department patients. *Annals of Emergency Medicine*, 41(5), 678-684.
  34. Lewis, L.M., Miller, D.K., Morley, J.E., Nork, M.J., & Lasater, L.C. (1995). Unrecognized delirium in ED geriatric patients. *The American Journal of Emergency Medicine*, 13(2), 142-145.
  35. Han, J.H., Bryce, S.N., Ely, W.E., Kripalani, S., Morandi, A., Shantani, A., Jackson, J.C., Storrow, A.B., Dittus, R.S., & Schnelle, J. (2009). The effect of cognitive impairment on the accuracy of the presenting complaint and discharge instruction comprehension in older emergency department patients. *Annals of Emergency Medicine*, 57(6), 662-671.
  36. Ibid.
  37. (2013). The geriatric emergency department guidelines. American College of Emergency Physicians, The American Geriatrics Society, Emergency Nurses Association, & the Society for Academic Emergency Medicine. <https://www.acep.org/geriedguidelines/>. Accessed June 2017.
  38. Cubanski, J., & Neuman, T. (2016). The facts on Medicare spending and financing. Kaiser Family Foundation.
  39. Moore, B., Levit, K., & Elixhauser (2012). Costs for hospital stays in the US, 2012. Agency for Healthcare Research and Quality. <https://www.hcup-us.ahrq.gov/reports/statbriefs/sb181-Hospital-Costs-United-States-2012.pdf>. Accessed June 2017.
  40. Dartmouth Atlas Project, PerryUndem Research & Communications (2013). The revolving door: A report on U.S. Hospital Readmissions. Robert Wood Johnson Foundation. <http://www.rwjf.org/en/library/research/2013/02/the-revolving-door%2D%2Da-report-on-u-s%2D%2Dhospital-readmissions.html>. Accessed June 2017.
  41. Ibid.
  42. Centers for Disease Control and Prevention. Multiple Chronic Conditions. [www.cdc.gov/chronicdisease/about/multiple-chronic.htm](http://www.cdc.gov/chronicdisease/about/multiple-chronic.htm). Accessed June 2017.

43. Szlejf, C., Farfel, J.M., Curaiti, J.A., Couto Junior, E., Jacob-Filho, W., & Azevedo, R.S. (2012). Medical adverse events in elderly hospitalized patients: A prospective study. *Clinics*, 67(11), 1247–1252.
44. Bo, M., Bonetto, M., Bottignole, G., Porrino, P., Coppo, E., Tibaldi, M., Ceci, G., Raspo, S., Cappa, G., & Bellelli, G. (2016). Length of stay in the emergency department and occurrence of delirium in older medical patients. *Journal of the American Geriatrics Society*, 64(5), 1114–1119.
45. Fong, T.G., Tulebaev, S.R., & Inouye, S.K. (2009). Delirium in elderly adults: Diagnosis, prevention and treatment. *Nature Reviews Neurology*, 5(4), 210–220.
46. Ibid.
47. Fong, T.G., Inouye, S.K., & Jones, R.N. (2017). Delirium, dementia, and decline. *Journal of American Medical Association Psychiatry*, 74(3), 212–213.
48. Chodos, A.H., Kushel, M.B., Greysen, S.R., Guzman, D., Kesel, E.R., Sarkar, U., Goldman, L.E., Critchfield, J.M., & Pierluissi, E. (2015). Hospitalization-associated disability in adults admitted to a safety-net hospital. *Journal of General Internal Medicine*, 30(12), 1765–1772.
49. Reichardt, L.A., Arden, J.J., van Seben, R., van der Schaaf, M., Engelbert, R.H.H., Bosh, J.A., & Buurman, Bianca, M. (2016). Unraveling the potential mechanisms behind hospitalization-associated disability in older patients; the hospital associated disability and impact on daily life (hospital-ADL) cohort study protocol. *British Medical Journal geriatrics*, 16, <https://doi.org/10.1186/s12877-016-0232-3>.
50. Covinsky, K.E., Pierluissi, E. & Johnston, C.B. (2011). Hospitalization-associated disability: “She was probably able to ambulate, but I’m not sure.” *The Journal of the American Medical Association*, 306(16), 1782–1793.
51. <https://www.fhca.org/members/qi/clinadmin/global.pdf>. Accessed June 2017.
52. Fick, D.M., Steis, M.R., Waller, J.L., & Inouye, S.K. (2013). Delirium superimposed on dementia is associated with prolonged length of stay and poor outcomes in hospitalized older adults. *Journal of Hospital Medicine*, 8(9), 500.
53. Cole, M.G., Bailey, R., Bonnycastle, M., McCusker, J., Fung, S., Ciampi, A., Belzile, E., & Chun B.M. (2015). *Journal of the American Geriatrics Society*, 63(11), 2340–2348.

54. lezzoni, L., Dorner, S., & Ajayi, T. (2016). Community Paramedicine—Addressing Questions as Programs Expand. *The New England Journal of Medicine*, 374,(12), 1107–1109.
55. <https://www.dispatchhealth.com>. Accessed June 2017.
56. <https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/HomeHealthQualityInits/HHQIHomeHealthStarRatings.html>.
57. Becker, M., Boaz, T., Ross, A., Gum, A.M., & Papadopoulos, A.S. (2010). Predictors of preventable nursing home hospitalizations: The role of mental disorders and dementia, *American Journal of Geriatric Psychiatry*, 18(60), 475–82.
58. Xing, J., Mukamel, D.B., & Temkin-Greener, H. (2013). Hospitalizations among nursing home residents in the last year of life: Nursing home characteristics and variation in potentially avoidable hospitalizations. *Journal of the American Geriatric Society*, 61(11), <https://doi.org/10.1111/jgs.12517>.
59. Stephens, C.E., Newcomer, R., Blegen, M., Miller, B. & Harrington, C. (2012). Emergency department use by nursing home residents: Effects of severity of cognitive impairment, 52(3), 383–393.
60. Stephens, C.E., Sackett, N., Govindarajan, P., & Lee, S.J. (2014). Emergency department visits and hospitalizations by tube-fed nursing home residents with varying degrees of cognitive impairment: a national study. *BMC Geriatrics*, 14(1), 1.
61. Givens, J.L., Selby, K., Goldfeld, K.S., & Mitchell, S.L. (2012). Hospital transfers of nursing home residents with advanced dementia. *Journal of American Geriatric Society*, 60(5), 905–9.
62. <http://www.mountsinai.org/about-us/newsroom/press-releases/icahn-school-of-medicine-at-mount-sinai-receives-health-care-innovation-award-from-centers-for-medicare-and-medicaid-services>. Accessed June 2017.
63. Under a bundled payment agreement, the insurer makes one payment for the total care linked to a particular procedure or period of time. This fee covers the cost of care across the continuum.
64. Caplan, G.A., Sulaiman, N.S., Mangin, D.A., Aimonino Ricauda N., Wilson, A.D., & Barclay, L. (2012). A meta-analysis of “hospital in the home.” *The Medical Journal of Australia*, 197(9), 512–519.
65. Leff, B., Burton, L., Mader, S.L., Naughton, B., Burl, J., Inouye, S.K., Greenough, W.B., Guido, S., Langston, C., Frick, K.D., Steinwachs, D.,

- & Burton, J.R. (2005). Hospital at Home: Feasibility and outcomes of a program to provide hospital-level care at home for acutely ill older patients, *Annals of Internal Medicine*, 143(11), 798.
66. Single payer is health insurance that is financed by a governmental with care delivered by public providers.
  67. Managed care organizations function as the insurer, administrator, and provider of healthcare.
  68. <https://aspe.hhs.gov/ptac-physician-focused-payment-model-technical-advisory-committee>. Accessed June 2017.

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