
Targeting Enhanced Services Toward High-Cost, High-Need Medicare Patients

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Theresa is a 65-year-old woman with type 2 diabetes on insulin complicated by neuropathy and nephropathy, congestive heart failure, hypertension, dyslipidemia, stage III chronic kidney disease, obstructive sleep apnea, and depression who was admitted to the hospital with acute decompensation of chronic systolic heart failure. In the week leading up to her current hospitalization, she gained 20 lb and had weeping wounds on her legs with painful edema. Her glycosylated hemoglobin was 13.6 %. She had run out of insulin and missed several doses of her antihypertensive medications. She was new to the hospital system, having recently moved to the area to live with her sister. Theresa was prescribed 12 medications, regularly saw four specialists in her former hometown, and had three hospital admissions for shortness of breath in the past year.

Theresa is an older adult who struggles to manage her multiple chronic conditions (MCC), resulting in frequent hospitalizations and emergency department (ED) visits. The complexity of Theresa's care may remind clinicians across the country of similar patients they see in their hospitals and clinics. These high-cost, high-need patients

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compose a small proportion of America's population, but account for a majority of our health-care expenditures. Despite these high health-care costs, patients like Theresa do not often receive the optimal health-care services to meet their comprehensive needs. The needs of patients with MCC, functional limitations, and complex social challenges are often mismatched with our fragmented, disease-centered health-care system. This chapter will describe characteristics of high-cost, high-need patients, highlight health-care reforms offering new opportunities to improve their care, and provide an overview of evidence-based models of care that may better meet their comprehensive needs.

Defining High-Cost, High-Need Populations

Although clinicians commonly encounter patients like Theresa, there is little consensus about how to define this vulnerable population and little research exploring the range of variability within this population. Although patients are unlikely to self-identify with existing labels, terms commonly ascribed to this population include “high-utilizers,” “super-utilizers,” “super-users,” and more recently “high-cost, high-need patients” [1]. Definitions are also varied, ranging from qualitative descriptions such as the Centers for Medicare & Medicaid Services (CMS) definition as those who have “complex, unaddressed health issues and a history of frequent encounters with health care providers” [1], to using common statistical practices to define the population as those who are two standard deviations from the norm in their use of health-care services [2]. Increasingly, the definition has revolved around the issue of cost, as health-care spending nationally continues to soar and hospital utilization accounts for the majority of health-care costs.

Whether words or numbers are used to describe characteristics of this population, individuals identified through these methods are both medically and socially complex. The Agency for Healthcare Research and Quality (AHRQ) defines “complexity” as the magnitude of mismatch between a patient's needs and the services available to him/her in the health-care system and community [3]. This definition may capture the underlying systemic causes of frequent hospitalizations for individuals with complex health needs. On one hand, defining “high-utilizing” individuals based on consumption of health-care resources alone discounts the unmet needs of individuals. Conversely, while individual needs vary, focusing solely on individual needs fails to recognize the system-level challenges and opportunities that these individuals reveal. Thus, we will use the term “high-cost, high-need patients” for the duration of this chapter to emphasize the mismatch between complex individual needs and traditional health-care system resources for this patient population.

Disproportionate Health-Care Costs

The concept that a small proportion of the population can account for a large amount of health-care costs [4, 5] has been receiving increased attention as health-care reform efforts target the “triple aim” of better health, better health care, and better

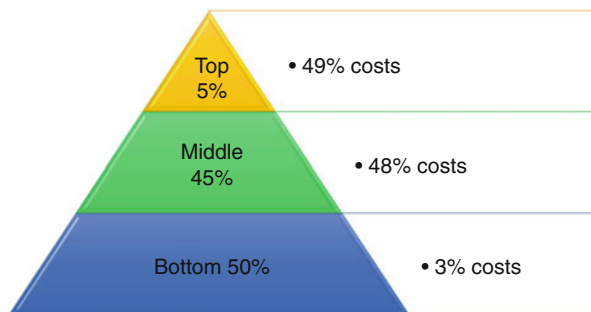


Fig. 2.1 This pyramid represents the distribution of medical expenditures for Americans of all ages, as assessed through the Medical Expenditures Panel Survey in 2002 [8]. The top 5 % of the population accounted for 49 % of health-care expenditures nationally. Conwell LJ, Cohen JW. Characteristics of Persons with High Medical Expenditures in the U.S. Civilian Noninstitutionalized Population, 2002. Rockville, MD: Agency for Healthcare Research and Quality, 2005

value [6]. Across all age groups, 5 % of the population accounts for almost 50 % of annual health-care expenditures (Fig. 2.1), with the top 1 % accounting for 22 % of annual health-care expenditures [7, 8]. One may expect such a skewed distribution when a large portion of healthy individuals are using little to no health-care services, but this distribution also holds true within the Medicare population, where 2/3 of beneficiaries are managing MCC [9]. Within the Medicare fee-for-service program, the top 5 % of beneficiaries account for 39 % of total Medicare spending, and 25 % of beneficiaries account for 82 % of all spending [10].

As the number of chronic conditions rises, so does health-care utilization. High-cost, high-need patients within the Medicare population are the highest utilizers of the hospital [11], and it is through hospital admissions that most costs are accrued. The 14 % of Medicare beneficiaries with six or more chronic conditions account for almost half of all Medicare spending and 70 % of hospital readmissions [9]. Outside of the hospital, those with MCC also utilize home health services more frequently, visit physician's offices more often, and have more ED visits.

Complex Medical Needs

Increasing numbers of chronic conditions are closely associated with increasing health-care costs. Of the top 5 % of Medicare spenders, 93 % have three or more chronic conditions [12]. Certain chronic conditions, such as chronic kidney disease, congestive heart failure, chronic lung disease, anxiety or depression, and cancer, are well-established risk factors for hospital readmission [10, 13–15]. For individuals over the age of 50, depression and cognitive impairment are independent and synergistic risk factors for hospitalization for ambulatory care sensitive conditions [16].

Having MCC alone is not sufficient to explain patterns of frequent hospitalizations. In 2010, almost two out of every five Medicare beneficiaries with six or more

chronic conditions were not admitted to the hospital, roughly half did not use post-acute care, and well over half did not engage in home health services despite their MCC [9]. Having chronic conditions severe enough to impact daily function may be a critical characteristic of high-cost, high-need patients. Of the top 5 % of Medicare spenders, 61 % have a combination of MCC and functional limitations [12]. Having a hospital admission is the single largest risk factor for developing a functional impairment with a hazard ratio of 61.8 (95 % CI 49.0–78.0) for a hospitalization alone and 223 (95 % CI 138–362) for a hospitalization with a subsequent nursing home admission [17]. Beneficiaries who have chronic conditions and limitations in activities of daily living (ADLs) average twice the cost of those with three chronic conditions without functional limitations [12].

Patients with MCC often incur high treatment burdens in a health-care system designed to optimize the care of individual diseases in isolation of each other [18, 19]. Guidelines and recommendations for one chronic condition often conflict with that of another, putting patients at risk of therapeutic competition and complications [20]. This fragmented, disease-focused system requires health-care consumers to be savvy and to take an active role communicating among specialists and primary physicians. Most older adults (70 %) self-manage their illnesses, and almost 40 % found this management so burdensome and difficult that they did not complete and or delayed completion of recommended health-related tasks [21]. Difficulties with self-management can be compounded by both cognitive impairment and low health literacy as adults over age 65 have the highest proportion of persons who are below basic levels of health literacy [22].

While many high-cost, high-need patients have potential to achieve stable outpatient management of their conditions with greater supports, some do not enter this population until the last year of life with end-stage illnesses. Almost a third of high-cost, high-need patients are those who are in their last year of life [23]. Health-care spending increases toward the end of life [24], with 30 % of costs for a dying Medicare beneficiary in the last year incurred in the last month of life and 25 % of total Medicare expenditures paid toward decedents in their last year of life [25]. Over time, there have been trends toward more frequent hospitalizations in the last 3 months of life and increasing numbers of deaths in intensive care units concurrently with increased use of the Medicare hospice benefits [26–28]. Despite these utilization trends in the last year of life, the total proportion of Medicare spending toward descendants has remained stable at 5 % of total expenditures [23, 28]. While there is some evidence that those enrolled in hospice have less acute care utilization at the end of life [29] and are less likely to die in the acute hospital [27], studies examining cost-savings of hospice services show mixed results [25, 30–32].

Complex Social Needs

Theresa moved in with her sister after leaving an abusive husband in another state. She left with only her purse and a few medication bottles. Since then, she hadn't had the money to refill her prescriptions and had not been able to establish a new

primary care doctor. She had Medicare Part A to cover hospital costs, but was worried about the costs of seeing a physician in clinic as she had not enrolled in Medicare part B. She considered enrolling in Medicare Part D for prescription coverage, but found the paperwork overwhelming and the copays too expensive. She had completed high school, but always struggled with reading.

During previous admissions, Theresa's discharge instructions always advised her to weigh herself daily, to check her blood sugar four times daily, and to eat a special "diabetic diet" limited to "two grams of sodium." She didn't own a scale and was not confident in applying the dietary recommendations to her life, particularly now that she was eating meals prepared by her sister. She limited her blood sugar checks to conserve expensive glucometer test strips. She feared the symptoms associated with past hypoglycemic episodes, so often skipped insulin doses rather than risking low blood sugars. Afraid of being judged for not following medical advice, she avoided following up in clinic after hospital stays.

While some disparate utilization can be expected for medically complex patients, difficulty navigating the health-care system and inadequate attention to social determinants of health can compound medical needs and contribute to high hospital utilization patterns [1, 33]. Social and systemic factors associated with high-cost, high-need populations include having low income, belonging to minority populations, having a history of childhood trauma, and having difficulty accessing primary care [10, 15, 34, 35]. Among Medicare beneficiaries specifically, living alone has been a strong predictor of hospital readmission risk in addition to having new or unmet functional needs, lacking self-management skills, having limited education, and having fair to poor satisfaction with one's primary care physician [36, 37].

Personal factors and goals may also contribute to hospital utilization patterns. Desire for aggressive care has been identified as a strong predictor of future utilization as well as the perception of the primary care provider-patient relationship and the quality of care received from the primary provider [38]. Qualitative analyses of interviews with high-cost, high-need patients have highlighted some perceptions these individuals have of their own care. Some patients express that early-life trauma contributes to difficult interactions with health-care providers as adults and that caring relationships with primary care providers are important to their well-being [35]. Patients have also described choices to go directly to the ED when experiencing symptoms are related to poor primary care access or a belief that primary care was ineffective [39].

The complex medical, social, and functional needs of high-cost, high-need patients represent both challenges in our current health-care system and opportunities for improvement. Greater attention to the context of a patient's illness and the resources available to him/her may allow for better customization of services aligned with individual needs.

Hospitalization Risk Prediction Models for Clinicians

Theresa's age, previous hospital admissions in the past year, and her multiple medical conditions prompted referral to the hospital's transitional care program. A social worker assessed her financial challenges and connected her with access to primary care. Her reading level was estimated to be less than eighth grade, so health information was conveyed using the teach-back method, and she received informational handouts intended for those with low literacy. She was provided a pill box for medication management and a scale at no charge. A transitional care nurse practitioner provided a rapid post-discharge follow-up visit to Theresa the day after she left the hospital. The nurse practitioner reconciled her medications, reinforced the teaching regarding diabetes management and heart failure management begun in the hospital, and helped her call her new primary care provider's office to schedule an urgent visit when it was discovered that her morning blood sugar was >400.

For most individuals, the use of medical resources is not static throughout their lives, and the progression to high utilization of health care usually begins when mounting medical and psychosocial needs exceed the ability of the traditional health-care systems to accommodate them. Researchers have begun exploring how to predict which individuals will reach this threshold but overall, risk prediction models have fair to poor performance at prospectively predicting hospital readmissions. Most risk prediction models account for past utilization and medical comorbidities. However, few include markers of illness severity, overall function, or social determinants of health due to the scarcity of these factors in medical documentation [40].

The Probability of Repeated Admissions (P_{ra}) score is one such prediction model. It is a score to estimate frequency of hospital admissions within 4 years calculated from questionnaires that include medical variables, demographic data, current health-care usage, and nonmedical factors like self-rated health and the presence an informal caregiver [41]. Since its publication in 1995, the P_{ra} has been validated in multiple settings, and the pooled results of these applications have shown the score to have high specificity for predicting elderly individuals who will admit frequently. However, its sensitivity for identifying those at high risk for hospital readmission is limited, and it may miss high-risk individuals who lack the specific risk factors explored in the questionnaire [42].

Because survey responses can be poor and those at highest risk for readmissions may be less apt to complete a questionnaire, other models have been sought. The LACE index, calculated using data available in the medical record, can predict unplanned hospital readmissions and mortality in currently hospitalized patients, which could help target interventions for readmission prevention before a cycle of recurrent admissions has begun. The index relies on four key variables: length of admission, acuity of the admission, comorbid conditions, and emergency room usage [43, 44].

Beyond individual socioeconomic risk factors for hospital utilization, recent studies have demonstrated environmental associations between living in resource-poor neighborhoods and being at risk for 30-day hospital readmissions [45]. The Area Deprivation Index is a measure of neighborhood-level socioeconomic

disadvantage based on national census data that independently predicts hospital readmission after controlling for patient and hospital characteristics. The University of Wisconsin Health Innovation Program maintains a publically available tool (www.HIPxChange.org/ADI), where clinicians can look up the Area Deprivation Index associated with any individual patient by entering his/her zip code [45].

Health-Care Reform Affecting Inpatient Care

The inpatient setting has become a target for incentives to reduce health-care spending because high-cost, high-need patients generate the bulk of their costs via hospital admissions. As part of the Affordable Care Act (ACA), the Hospital Readmissions Reduction Program penalizes hospitals for higher than national benchmark readmission rates for certain conditions within 30 days of discharge from an index hospital stay, regardless of whether an individual readmission was considered preventable. Hospitals with rates that are higher than average are subject to financial penalties of 3 % of total reimbursement as of 2015. When these percentages are scaled to a national level, they resulted about \$280 million in financial penalties during the first year of the program [9]. These financial incentives have led hospitals to focus more on preventing readmissions, leading to investment in some new resources for high-cost, high-need patients.

Hospital-Based Interventions to Reduce 30-Day Hospital Readmissions

After a hospital stay, the transition from hospital to home can be a hazardous time period for vulnerable patients. Interventions to coordinate care as patients transfer from hospital to home can improve patient safety and help hospitals avoid financial penalties. While transitional care interventions vary in scope and intensity, they have consistently yielded reductions in short-term hospital readmissions. The Care Transitions Intervention (CTI) is a successful model of transitional care that can be adapted to many contexts. It consists of four principle activities delivered by a registered nurse serving as a Care Transitions Coach®: (1) improved communication facilitated by a personal health record, (2) medication reconciliation and self-management coaching, (3) patient-scheduled follow-up appointments, and (4) patient knowledge of worsening clinical symptoms and how to respond [46]. CTI has reduced readmissions and lowered costs for community-dwelling adults 65 years and older who had been admitted to the hospital [47]. While the CTI was originally delivered by registered nurses during home visits, an adaptation of the CTI delivered by a nurse case manager over the telephone also demonstrated reductions in readmission rates [48].

In general, multicomponent interventions that support patient capacity for self-care are more successful at reducing 30-day readmissions than single-component interventions without patient or caregiver engagement [49]. Interventions can be classified

into three categories: (1) pre-discharge (patient education, medication reconciliation, comprehensive discharge planning, scheduling follow-up appointments prior to discharge), (2) post-discharge (follow-up telephone calls, patient hotlines, enhanced communication with outpatient providers, timely outpatient follow-up, and post-discharge home visits), and (3) bridging interventions (transition coaches, physician continuity from the inpatient to outpatient setting, and patient-centered discharge instructions) [50]. Hospitals are increasingly assembling readmission review teams, which offer data-driven opportunities to identify frequently admitted outliers. Readmission reviews are most effective when chart reviews are supplemented by patient, caregiver, and provider interviews to better understand the challenges these individuals face in the post-discharge period [51]. Readmission reviews can facilitate the identification of system-level care coordination deficits and offer an opportunity to connect high-cost, high-need patients to enhanced outpatient services.

Health-Care Reform Affecting Outpatient Care

Theresa built a strong relationship with her new primary care provider who worked closely with a social worker and the transitional care team to support her during her return home from the hospital. The clinic nurse called Theresa frequently to review her most recent weights and blood sugar values. Her provider documented these encounters carefully and used the transitional care management (TCM) billing codes to increase her reimbursement for the work.

After completing a 30-day period of outpatient management without returning to the hospital, Theresa's transitional care nurse referred her to a complex case management program affiliated with her primary care clinic. Theresa has been working with her case management team, which includes both a nurse and a social worker, to obtain adequate health-care coverage, find stable housing, seek low-cost legal counsel to help with her divorce from her husband, connect with community-based chronic disease self-management support services, and manage her medical problems with the multiple specialists involved in her care. Her primary care physician works closely with the case management team and is able to seek reimbursement for these care coordination services through Medicare's new chronic care management (CCM) billing code. Theresa has not been admitted to the hospital in 3 months, sees her primary care physician regularly, and reports an improved outlook on her health.

In addition to establishing financial penalties to hospitals with higher than expected readmission rates, the ACA has changed health-care financing to incentivize a wide array of health-care reform in the outpatient setting. Accountable Care Organizations (ACOs) allow for shared savings between health-care organizations and Medicare. The shared savings provide an incentive for organizations to invest in new health-care delivery models outside the scope of traditional fee-for-service health-care services. The ACO model allows health-care organizations to remedy many of the systemic ills that lead to ineffective care, decreasing acute care utilization and generating savings [52].

In addition to ACOs, several recent health-care reforms provide opportunities to enhance services for high-cost, high-need patients and shift some of their health-care utilization from inpatient to outpatient settings. Since over three million older adults with functional impairments are homebound [53], Medicare is evaluating the effectiveness of home-based primary care through the Independence at Home Demonstration Project. High-risk patients are selected for Independence at Home services who have ≥ 2 chronic conditions, who need assistance with ≥ 2 ADLs, and who have had a hospital admission with subacute rehabilitation or home health post-acute care in the year prior to enrollment [54]. Preliminary results show that the Independence at Home Demonstration Project improved quality of care while saving Medicare \$25 million dollars, or an average of \$3070 per participating beneficiary [55]. Even practices funded by traditional fee-for-service reimbursement structures can begin to enhance outpatient services through new Medicare billing codes. TCM and CCM billing codes offer new opportunities for adoption of evidence-based care coordination services. Medicare will also begin to reimburse physicians for goals of care conversations and end-of-life counseling in 2016 [56].

New Incentives for Care Coordination

While hospitals can be penalized for failing to prevent readmissions, outpatient clinics can earn additional revenue for coordinating care for vulnerable patients. The TCM codes 99495 and 99496 allow a physician or nonphysician practitioner to receive a higher rate of reimbursement for coordinating the care of a beneficiary discharging from multiple settings, including inpatient or observation hospital stays, skilled nursing facilities, long-term acute care facilities, rehabilitation hospitals, or community mental health center partial hospitalization programs (Table 2.1) [57]. Transitional care services must include communication with a patient or caregiver within 2 days of discharge, medication reconciliation, coordination with both hospital and community services, and a face-to-face post-discharge visit within either a 7-day period (99495) or 14-day period (99496) after discharge. Meeting the requirements to bill for these codes can be challenging, but when done correctly, this billing code generates about 15 % more revenue than a moderate or high acuity office visit would generate alone [57].

In January 2015, Medicare began offering incentives for care management services with the CCM billing code 99490. Care management encompasses a broad range of activities that assist high-risk patients and their families in managing medical and psychosocial challenges with the ultimate goals of improving care quality and reducing care costs [58]. Most high-quality research studies evaluating care management interventions have demonstrated improved quality of care and quality of life outcomes, but utilization outcomes have been mixed [58, 59]. Care management programs that have achieved the dual aims of higher quality and reduced costs share several common characteristics: (1) selecting patients at high risk for hospitalization, yet without such advanced illness such that hospice services would be more beneficial, (2) in-person encounters, including home visits, (3) specially trained care

Table 2.1 Comparison of key requirements for Medicare's transitional care management (TCM) and chronic care management (CCM) fee-for-service billing codes

	Transitional care management (TCM) [57]	Chronic care management (CCM) [60, 63]
Patients eligible for services	Patients discharged home from hospitals or facilities	Patients with ≥ 2 chronic conditions that place the patient at risk of death, acute exacerbation, or functional decline
Practitioners eligible to bill for services	Physicians, advanced practice nurses, physician assistants, clinical nurse specialists, certified nurse midwives	Physicians, advanced practice nurses, physician assistants, clinical nurse specialists, certified nurse midwives
Patient consent required	None	Written consent maintained in medical record
Non-face-to-face requirement	Communication with patient or caregiver within 2 business days of discharge, care management services	≥ 20 min/month of care coordination performed or supervised by the practitioner
Additional requirements	Medication reconciliation by date of face-to-face visit	Certified EHR, electronic care plan, 24/7 access, transitional care, care coordination
Reimbursement	2.11 (99495) or 3.05 (99496) relative value units (RVUs)	\$40.39 per patient per month in 2015

managers with low caseloads, (4) multidisciplinary teams that involve physicians, especially when care managers are co-located in primary care practices, (5) engagement of informal caregivers, and (6) coaching patients and families in self-management skills [58].

The Medicare CCM billing code 99490 specifies the patients eligible for care management services and provides a structure for their delivery. Medicare beneficiaries are eligible for CCM services if they have ≥ 2 chronic conditions that place them at significant risk of death, acute exacerbation/decompensation, or functional decline [60, 61]. If such beneficiaries provide written consent to receive CCM services, qualifying practices may bill for at least 20 min of non-face-to-face care coordination activities per month per beneficiary. Only one provider may bill this code per patient per month and it may not be used in conjunction with the TCM codes. These services are reimbursed at \$40.39 per patient per month, so could generate almost \$100,000 additional revenue for 200 enrolled patients [62, 63]. Depending on the number of patients enrolled, this reimbursement mechanism may provide enough revenue for an average primary care practice to hire a nurse case manager who can be co-located within the practice. In order to bill Medicare for CCM, a practice must offer seven CCM components [60]. The practice itself must offer continuous access to the care team and electronic medical records after-hours, continuity with a designated provider, and multiple avenues of communication (e.g., telephone, web portals) [60, 63]. Clinicians must generate comprehensive care plans that address patients' medical, cognitive, functional, and psychosocial needs in the context of their environments, support networks, and goals of care [60].

Clinicians must also manage patients' chronic conditions, manage care transitions, and coordinate with home- and community-based services to support psychosocial and functional needs [60, 63]. Geriatricians at the University of California, San Francisco developed a four-step pathway for primary care physicians to meet the CCM comprehensive care plan requirement, called the CARES tool. The four steps include: (1) determine the likelihood of care and coordination needs, (2) establish goals of care, (3) assess medical, functional, psychosocial, and environmental care needs, and (4) match resources to needs [60].

Hot Spotting for High-Cost, High-Need Patients

A key component to the ACO model is the concept of “population health management” or panel management. Population health can be defined as “the health outcomes of a group of individuals, including the distribution of such outcomes within the group” [64]. Whether the population of interest is as small as a primary care panel or as large as a geographic county, population-level data allows individuals within the population to be stratified by the complexity of their needs helping to match services to needs. A major area of research interest is better understanding how to match the optimal health-care innovations with the specific populations who are most likely to benefit [65].

Models of care that target the outliers with the highest utilization rates of inpatient services are often called “hot spotting.” The use of this term within health care originated from the work of Jeffrey Brenner, who created population health data tracking systems and developed the Camden Coalition of Healthcare Providers to reach beyond clinic walls into the community for low-income patients in Camden, NJ [66]. By geocoding patients' addresses, eight buildings within the city plus the homeless population were identified to account for \$12.5 million in health-care expenditures [66]. Geocoding of health-care costs and isolating “hot spots” can help identify social and environmental influences on health and hospital utilization most relevant to local populations.

The Camden Coalition of Healthcare Providers serves high-cost, high-need patients of all ages and bases its care model on the principle that understanding outliers provides information about failures of health-care and community systems. The organization uses data to identify and engage patients who inform system redesign [67]. The organization has developed a cross-site learning collaborative for others interested in “hot spotting” [68] and offers annual mini-grants to teams of health professional students interested in working with high-cost, high-need patients in their own communities [69]. The Association of American Medical Colleges (AAMC) has published a 10-step “Guide to Hot Spotting” for medical students. It focuses on having trainees identify and work with individual patients with patterns of frequent utilization longitudinally through a number of experiences including visiting a patient at home to get to know them as a person, accompanying them to medical visits, and identifying and helping the patient work on factors contributing to utilization (www.aamc.org/hotspotter) [70]. Any health-care provider or trainee can follow the AAMC guide to hot spotting with institutional support. The ultimate

goal of the trainee “hot spotting” experience is to use lessons learned from the in-depth case analysis to engage administrators and educators in systems change.

Comprehensive Primary Care for Patients with Multiple Chronic Conditions (MCC)

While geriatric models of care have not traditionally been studied only in high-cost, high-need populations, they have generally been studied in populations of older adults with MCC and/or functional deficits. Since it is known that Medicare beneficiaries with both MCC and functional deficits account for more disproportionate health-care costs than those with chronic conditions alone, geriatric models of care may provide important insights into how to care for high-cost, high-need populations [12].

Almost all outpatient geriatric models of care are grounded in the Chronic Care Model, which has informed many interventions that demonstrated improved health outcomes for patients since its conceptualization in 2000 [71]. The Chronic Care Model is a conceptual framework for optimizing health delivery services for individuals living with chronic illnesses. It requires collaboration between health systems and communities to build an infrastructure for support in six areas: self-management support, decision support, delivery system design, clinical information systems, health-care organization, and community resources. This care delivery framework enables health-care systems to offer proactive, team-based care to support patients in becoming both informed of and engaged in their care, facilitating interactions that lead to improved health outcomes [72]. The Patient-Centered Medical Home (PCMH) is a widely disseminated intervention based on principles of the Chronic Care Model. While large-scale studies of PCMH have not demonstrated cost-savings [73], a potential concern about PCMH implementation is that the intervention may have been targeted too broadly rather than focusing on the high-risk patients who had the most potential to benefit [74].

Many foundational components of comprehensive primary care models align with the required activities for Medicare’s CCM billing code described above. Multidisciplinary teams provide comprehensive assessments, development and implementation of evidence-based care plans, communication among all specialties and facilities involved in a patient’s care, coordination of care transitions, and connection with home- and community-based resources [75]. The Program of All-Inclusive Care for the Elderly (PACE) is the most established and long-standing model for delivering such comprehensive primary care, but requires special financing with monthly capitated payments from Medicare and Medicaid per member per year. PACE provides team-based primary care and community supports specifically for low-income (Medicaid-eligible), nursing home-eligible Medicare beneficiaries who wish to remain living in their community homes. PACE patients have longer survival and lower rates of hospitalizations and emergency room visits than similar patients in traditional care systems [75, 76].

Comprehensive primary care can also be supported in more traditionally structured primary care practices through comanagement models with geriatric multidisciplinary teams. The Geriatric Resources for Assessment and Care of Elders (GRACE) is a home-based care management model where an off-site multidisciplinary geriatric team comanages low-income older adults in conjunction with their previously established primary care providers [77]. An advanced practice nurse and social work team form a mobile unit that communicates among patients in their homes, the multidisciplinary geriatric team, and the primary care provider. GRACE has demonstrated improved quality of care and reductions in hospitalizations and emergency rooms visits for high-risk subgroups of older adults (P_{ra} score ≥ 0.4), but has not demonstrated cost-savings for lower risk populations [78]. In conjunction with new ACO models, GRACE has now been implemented in multiple sites around the country specifically targeting older adults with MCC, socioeconomic stressors, and ≥ 1 functional impairment, consistently demonstrating reductions in hospitalizations and readmissions [79].

Community-Based Programs for Older Adults

Evidence-based interventions that improve outcomes for older adults with MCC have disseminated more rapidly through community-based organizations than they have through the health-care system. About \$20 million per year in federal funding from the Older Americans Act supports the dissemination of evidence-based health promotion programs through Area Agencies on Aging and affiliated organizations throughout the country [80].

One example of the greater than 30 community-based programs that meet the National Council on Aging's highest-tier criteria [81] for evidence-based health promotion programs is the Chronic Disease Self-Management Program (CDSMP). The CDSMP is a 6-week workshop, designed by researchers at Stanford University, which promotes generic self-management skills applying to problems of MCC rather than skills that apply to a specific disease. It is led by lay leaders who have chronic conditions themselves and supports behavior change through role modeling and self-mastery [82]. The program has decreased emergency room visits and hospitalizations for its participants in both randomized controlled trials and real-world effectiveness studies [82, 83]. Clinicians can find community organizations licensed to deliver CDSMP workshops in their states by visiting the Stanford School of Medicine Patient Education and Resource Center website [84]. Other evidence-based community workshops address fall prevention, caregiver support, pain management, and disease management.

Summary

There are many inpatient, outpatient, and community-based services that can meet the complex needs of high-cost, high-need Medicare patients. Twenty-first-century health-care reform offers new opportunities to translate evidence-based models of

care for complex patients into practice. New care delivery models such as ACOs and home-based primary care can improve quality of care and reduce costs. New incentives, such as hospital readmission penalties and outpatient reimbursement for care coordination, can also help traditional health-care delivery systems to enhance services for high-cost, high-need Medicare patients.

8–10 Take-Home Points

1. High-cost, high-need patients account for disproportionate health-care costs. In the Medicare population, 5 % of fee-for-service beneficiaries account for 39 % of total Medicare spending.
2. Many of the high-cost health-care services are repeated hospitalizations, with hospitalization being recognized as one of the most expensive medical interventions.
3. Medical, social, and functional complexity contributes to frequent hospitalizations. The AHRQ Multiple Chronic Conditions Research Network defines complexity as the magnitude of mismatch between a patient's needs and the services available to him/her in the health-care system and community.
4. Of the top 5 % of Medicare spenders, 93 % have three or more chronic conditions (MCC). 61 % have a combination of MCC and functional limitations.
5. Social and systemic risk factors associated with frequent hospitalization include living alone, low socioeconomic status, non-White race, history of childhood trauma, lack of self-management skills, poor primary care access, and low satisfaction with one's primary care provider.
6. High-cost, high-need patients can benefit from transitional care in the inpatient and outpatient settings. Medicare started reimbursing outpatient providers for transitional care management in 2013.
7. High-cost, high-need patients can benefit from care management. Medicare started reimbursing outpatient providers for chronic care management in 2015.
8. Models of care that target the outliers with the highest utilization rates of inpatient services are often called "hot spotting." Trainees can engage in hot spotting with faculty support, using lessons learned from in-depth case analyses to engage administrators and educators in systems change.
9. Multiple models exist to help assess and meet the needs of patients with multiple chronic conditions. These models emphasize individualized care that addresses both medical and nonmedical needs, using a team-based approach.

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