The Ironic Business Case For Chronic Care In The Acute Care Setting

Patients with chronic illnesses already have an impact on the financial health of hospitals—and that impact is growing.

by Albert L. Siu, Lynn H. Spragens, Sharon K. Inouye, R. Sean Morrison, and Bruce Leff

ABSTRACT: The U.S. health care system provides acute care tools to deal with the problems of chronic disease, and strategies are needed to engage hospitals in chronic care innovations. Acute care–based models that improve chronic care have been developed, but their diffusion is limited by the absence of a business case for adoption. Yet a financial case for improving chronic care is possible by aggregating previously tested models into a service line that can be customized to local circumstances. Beyond benefits to hospitals, patients and payers could benefit from improved patient outcomes and costs; society could benefit from more appropriate deployment of resources. [*Health Affairs* 28, no. 1 (2009): 113–125; 10.1377/hlthaff.28.1.113]

In recent decades, chronic disease has emerged as the main contributor to adverse health outcomes and health-related costs in the United States. Chronic disease care has also emerged as a major challenge for health care leaders struggling to develop systems to deliver high-quality, cost-effective care.[1] Although chronic disease is a problem across the age span, the challenge of caring for people with chronic illnesses will intensify as our society ages and the prevalence of chronic disease increases.[2]

■ **Chronic illness care in the ambulatory setting.** Most experts believe that it is preferable to manage chronic disease in the ambulatory setting, and consensus as to what constitutes high-quality, complex chronic illness care has coalesced around the Chronic Care Model (CCM).[3] This model entails changes to the health care sys-

Albert Siu (albert.siu@mssm.edu) is the Ellen and Howard Katz Chairman and Professor in the Brookdale Department of Geriatrics at Mount Sinai School of Medicine and the James J. Peters VA Hospital in New York City. Lynn Spragens is president and chief executive officer of Spragens and Associates in Durham, North Carolina. Sharon Inouye is a professor of medicine at the Aging Brain Center, Harvard Medical School, in Boston, Massachusetts. Sean Morrison is a professor of geriatrics at Mount Sinai School of Medicine. Bruce Leff is an associate professor of medicine, Division of Geriatric Medicine, at the Johns Hopkins University School of Medicine in Baltimore, Maryland.

DOI 10.1377/hlthaff.28.1.113 ©2009 *Project HOPE–The People-to-People Health Foundation, Inc.*

tem, chiefly in the ambulatory setting, to support the development of informed, activated patients and prepared health care teams to improve outcomes. In another initiative, physician professional societies and employer groups have joined forces to promote the development of patient-centered medical homes to improve the care of complex chronic illness by increasing payments to physicians in the ambulatory setting to provide coordinated medical care.[4]

■ **Chronic disease care in the acute care setting.** To a large extent, the CCM and patient-centered medical home have "worked around" the hospital and acute care system in the context of delivering chronic illness care. Yet our delivery and payment systems ironically provide largely acute care tools to deal with the problems of chronic disease. The acute care platform is favored under current payment systems and is the dominant driver of health care costs, but to date it has not been strategically engaged in the management of complex chronic illness. Inclusion of the acute care setting in chronic illness management is essential because even when managed ideally, patients with chronic illnesses are commonly admitted to the hospital. Rates of inpatient hospitalization, hospitalization for ambulatory care–sensitive (ACS) conditions, and hospitalizations associated with avoidable and costly complications all increase with the number of chronic conditions a person has. Among Medicare beneficiaries, hospitalizations for ACS conditions increase approximately 360-fold for people with ten or more chronic conditions compared to those with no chronic conditions.[5] Even among populations with multiple chronic conditions who are receiving care in CCM-oriented models, such as the Program of All-Inclusive Care for the Elderly (PACE), rates of hospitalization are high.[6]

Further, recent innovative care delivery models (such as Guided Care, built on CCM principles and focused on the most costly, highest-risk, and multimorbid patients) have recognized the importance of the hospital in chronic illness management and the fact that attending to acute illness episodes is integral to the delivery of chronic illness care. Guided Care has developed strong programmatic components focused on the interface of the ambulatory and acute care settings.[7]

■ **The business case for using both care settings.** For the health of patients and our health care delivery system, strategies need to be devised to engage hospitals and assist them in adopting innovative chronic care models to achieve quality and cost goals—not to the exclusion of, but in addition to, ambulatory care approaches. Interestingly, the growing severity of the problem provides the basis for a reasonable business case for action to embrace the acute care platform in the delivery of high-quality, cost-effective care for complex chronic illness. Hospitals are operating close to full capacity, and the lack of capacity reduces growth of profitable service lines. Second, 37 percent of hospital discharges and 50 percent of inpatient days nationwide are for patients over age sixty-five, and these percentages will certainly increase in the next decade.[8] Finally, Medicare has recognized the importance of acute care in the context of chronic illness; the Medicare Payment Advisory Commission (MedPAC) recently recommended reporting resource use for inpatient stays plus

thirty days postdischarge, with the intent to tie this to payment changes in two years.[9]

Concomitantly, a business case for better chronic care is difficult to make solely on an ambulatory care platform, except under limited circumstances in capitated environments. The fee-for-service (FFS) sector, which accounts for the bulk of the health care market, comprises primarily small practices, which lack the capital, personnel, equipment, information technology (IT) systems, and knowledge to broadly implement chronic disease care. Even for large provider groups in a noncapitated environment, there are major challenges to implementing effective chronic illness care.[10]

Although improvements are needed in many aspects of complex chronic illness care, the premises of this paper are threefold: (1) innovative models of cost-effective methods to improve the acute episodic care of patients with complex chronic illnesses have been developed and tested; (2) the dissemination of these models is hampered by, among other factors, the uncertain business case for chronic illness care in the current funding environment; and (3) these models will have a broader impact and stronger business case if they are aggregated into a portfolio of services or lines of service.

Innovative Models

Innovative models to improve the quality and cost-effectiveness of acute episodic care of patients with chronic illnesses have been described, developed, and tested. Their effectiveness is clear, but the magnitude of their effect has been limited, in part, because they have functioned in a Sisyphean fashion in the absence of aligned economic incentives.

Hospital-based programs such as Geriatric Evaluation and Management (GEM) programs, involving interdisciplinary assessment, management, and rehabilitation of targeted frail older people, have been shown to improve functioning and other outcomes in the Department of Veterans Affairs (VA).[11] Hospital-based nursing programs such as Nurses Improving Care for Healthsystem Elders (NICHE), a comprehensive program used by hospitals to foster systemwide improvements in the care of older people, have been adopted in more than 100 U.S. hospitals.[12] A related program, the Hospital Elder Life Program (HELP), which provides a nursing-centered interdisciplinary team approach applying standard protocols to prevent delirium and functional decline, has been adopted in more than sixty U.S. hospitals and in ten hospitals in Britain, Canada, and Australia.[13] Specially designed units (Acute Care for Elders [ACE] units) of interdisciplinary care and protocols to optimize self-care and functioning have been developed and disseminated to a limited degree.[14] Palliative care programs have been developed that employ an interdisciplinary approach to symptom management and focus on establishing goals of care, supporting patients and caregivers, and improving continuity; these programs are reported to improve symptoms and reduce inpatient

costs.[15]

Models that bridge the care continuum have been developed to improve care transitions, using advanced practice nurses to assist on both sides of the transition or by educating and empowering patients to be active participants in their care during transitions.[16] In addition, Hospital at Home models have been developed to provide acute hospital–level care in the home to substitute entirely for a traditional acute care hospital admission for patients with certain acute illnesses. Patients are usually identified in the emergency department (ED) and receive critical elements of acute hospital care (nurse and physician visits, diagnostics, and therapeutics) at home. Hospital at Home can also be deployed to facilitate early discharge from the acute care hospital. Hospital at Home has demonstrated a range of positive outcomes; however, current FFS payment does not align with program design.[17] Early adopters of Hospital at Home have been largely limited to integrated health care delivery systems.

■ **Barriers to the dissemination of complex clinical interventions.** These models are complex clinical interventions and as such have faced substantial barriers to widespread adoption and dissemination.[18] Several factors influence the adoption of innovation: evidence of effectiveness, organizational culture and structure, financial costs and benefits, and other external pressures (for example, from the market).[19]

These models are often insufficiently described in the literature to allow potential adopters to understand all of the relevant adoption issues. Most models developed an evidence base that focused on patient-related outcomes to the exclusion of costs and other outcomes that are relevant for potential adopters. Models may present a difficult fit with an adopting organization's prevailing culture, as in the case of a palliative care program that might clash with beliefs about cure and life prolongation. Similarly, palliative care, transition, and Hospital at Home programs might clash with the independence of community physicians. In addition, all of these models often require teams of providers for implementation, which makes it difficult to pull such models "off the shelf." Adoption often requires collaborations across stakeholders within (as in hospital-based programs that cut across several departments) and between organizations (as in transition programs operating at the interface of different care settings). Even for programs that operate entirely within the hospital, crossing departmental and cost-center lines makes funding difficult, given the silo-based budgets and norms for recognizing revenue. Sometimes these programs fall between traditional boundaries of payment mechanisms and health care organizations (for example, transition care and Hospital at Home). Additionally, there is no societal mandate or clamoring for models focused on management of chronic illness care at the consumer level, similar to that seen for specific illnesses such as cancer.

■ **Biggest barrier to adoption.** We submit that the most important barrier to adoption and dissemination of these models is that the business case for their adop-

tion is limited under current reimbursement systems. Hospitalist programs have encountered many of these same obstacles, yet their diffusion has been rapid because of a compelling business case. In contrast, some of the chronic care models discussed above do not reduce costs to the sponsoring organization; instead, they provide clinical benefits at moderately increased or no incremental costs, as in the case of geriatric evaluation and management and ACE units.[20] Others of these programs may generate cost savings, as in the case of transition services, HELP, and palliative care.[21] However, because much of the benefit of improved communication, care plans, coordination, and symptom management results in "cost avoidance" or in the reduced incidence of outlier cases, the impact of these programs is difficult to track. Cost-accounting systems are poorly equipped to track what did not happen because of an intervention. Some programs may produce savings to the system by avoided hospital admissions or reductions in iatrogenic complications. These savings, however, may accrue to other cost centers (for example, if length-of-stay or intensive care unit use is reduced) or to a separate entity (such as an insurer) rather than to the entity paying for the model. There is also no or inadequate Medicare Part B professional fee reimbursement for many of the associated services such as transition services, interdisciplinary team members and meetings, family meetings, and disease management activities.

Thus, instead of generating new revenue or discernibly reducing costs, the usual business case for these programs currently is that they will provide clinical benefits that some patients may even take for granted (such as an averted complication) or not discern (such as improvement in a scale of functioning) at no or moderately increased cost to the sponsoring organization. That dissemination has been limited should come as no surprise.

The Business Case For Hospitals

A business case for the dissemination of chronic care interventions based on an acute care platform under current reimbursement systems is necessary; indeed, it is incumbent on hospitals to do so for their financial survival. Improved chronic care will require financial resources for the critical mass of interdisciplinary staffing, IT and other infrastructure, and access to multispecialty medical expertise and services, and, in some cases, for assuming financial risk. In many communities, the hospital is the organizing force and source of capital for major health care delivery initiatives of this scope. Hospitals also have a sizable and growing financial interest in improving chronic care. Medicare now accounts for 37 percent of hospital admissions and 50 percent of hospital bed-days, and the margins for Medicare nonsurgical admissions are at best small for many hospitals. Medicaid and uninsured patients with chronic illnesses add to the impact of chronic disease patients with lower reimbursement sources. Demographic projections of the aging of the population and service projections for the continuing migration of surgical procedures to the outpatient arena both indicate that nonsurgical admissions of

"Chronic disease patients represent a growing pool likely to have poor resource use relative to revenue generation."

patients with chronic illnesses will be an even larger portion of hospitals' business in the future. Given the narrow and precarious margins of hospitals and bed capacity issues, it is crucial to hospitals' financial stability to implement programs that minimize risk and increase the predictability of resource use in the chronic disease population.

The financial incentives for hospitals might not be immediately obvious for making the financial and other commitments necessary to adopt these models, but we believe that they can be identified and quantified. Indeed, palliative care programs have been increasingly successful in using data to demonstrate cost-per-day savings from excellent management of patients with complex chronic illnesses.[22] Further, the potential cost-effectiveness of individual programs may be improved by aggregating them into a portfolio of a chronic disease or full senior care services line that collectively achieves a critical mass of patient impact to justify management commitment and measurement of financial outcomes.

Building Blocks For Making The Business Case

Under current payment systems, a hospital's finances are maximized by increasing throughput (shorter lengths-of-stay and more cases) of higher-margin cases (surgical versus medical) with a reliably predictable course. Indeed, most hospitals have used a variety of techniques in the past two decades to manage the costs of these hospitalizations. Predictability is important to efficient scheduling and maximum use of high-cost technical resources. Patients with complex chronic illnesses put each of these necessary conditions at risk: they are more likely to be medical admissions with longer lengths-of-stay, frequently enter through the ED, and because of multiple conditions are less likely to be managed through standardized protocols. Thus, chronic disease patients represent a growing pool likely to have poor resource use relative to revenue generation, with higher-than-average variation in outcomes. Adopting better strategies for identifying these patients and providing the appropriate types of care to reduce variations in resource use needs to be a priority for hospitals.

We propose that a business case can be made for a portfolio of chronic disease or senior services that are customized to a hospital's local circumstances. Such a service line could include prehospital, hospital, and posthospital components (Exhibit 1). Although these models are distinct, they share several conceptual elements that promote an operational fit. These include a focus on vulnerable patients with chronic illnesses; an interdisciplinary team focus based on comprehensive assessment of the patient's needs; the attention paid to families and caregivers; and an orientation that looks beyond a single silo of care, focusing instead

EXHIBIT 1
Sources Of Hospital And Societal Return On Investment (ROI) In Chronic Care Models In A Senior Service Line Portfolio

Component	Prehospital	Hospital	Posthospital
Model	Hospital at Home	Hospital Elder Life Program (HELP), Acute Care for the Elderly (ACE) Units, and palliative care	Transitions programs
Goal	Provide acute hospital–level care at home and keep some patients out of the hospital	Move hospital patients through an acute hospital admission safely and efficiently	Prevent readmission and complex transitions and facilitate continuity of care
Target population	Patients who require hospital admission for specific diagnoses amenable to care at home	Patients age 70 and older and those with serious or life-threatening illness	Patients likely to require postacute care services
Source of hospital ROI	Reduce low- or negative-margin Medicare medical admissions Increase hospital capacity and backfill beds with high-margin admissions Revenues from billable services	Reduce length-of-stay and cost per day Backfill beds with high-margin admissions Reduce ED crowding and time on divert status Reduce penalties from preventable errors Increase satisfaction scores (CAHPS)	Reduce early readmissions, especially as definition of *admission episode* may be broadened
Source of societal ROI	Provide the right care in the appropriate setting, reduce iatrogenic complications, eliminate/improve transitions	Improve patient outcomes and reduce iatrogenic complications Reduce ED crowding and time on divert status	Reduce fragmentation and improve continuity of care
	Reduce overall (hospital and nonhospital) costs for the episode of illness Avoid building unneeded hospital beds Leverage investments in information technology Build care capacity across the continuum of care		

SOURCE: Authors' proposal for combining different programs in a senior service line.
NOTES: ED is emergency department. CAHPS is Consumer Assessment of Healthcare Providers and Systems.

on the continuum of care. An underlying rationale for the development of these models was to provide the highest-quality care in the least restrictive setting.

■ **Prehospital component.** For hospitals with serious capacity issues that lead to cancelled elective admissions and diverted EDs, the prehospital component may include instituting programs such as Hospital at Home or outpatient programs that reduce admissions for low-case-mix (for example, nonsurgical) and low-margin admissions. The business case for this component includes additional revenue from new case capacity (such as new surgical admissions), direct revenues from outpatient services provided to the Hospital at Home patient, and any reduction in losses from these low-margin patients who would otherwise have been admitted. Lost revenues and investments in the new programs would be offsets. Additionally, commercial payers in FFS environments could contract with hospitals to provide Hospital at Home care to the mutual benefit of the hospital and the payer.

■ **Hospital component.** The hospital component of the portfolio line could include programs (such as HELP, ACE, palliative care, and NICHE) that would move complex patients through the hospital stay more safely and efficiently and complement any existing hospitalist programs. Depending on the program, the source of return on investment (ROI) would be from reducing cost per case or per day, by potentially reducing lengths-of-stay and backfilling beds with high-margin admissions. Other potential savings could be derived by potentially reducing penalties and litigation from avoidable complications (such as delirium, falls, and functional decline) and preventable errors and by improving clinical outcomes and patient satisfaction (Consumer Assessment of Healthcare Providers and Systems, or CAHPS) scores (in the near future).

■ **Posthospital component.** Patients with complex chronic illnesses also present major challenges at discharge. One source of longer lengths-of-stay is the difficulty in developing safe discharge options for these patients. To prepare for discharge, the posthospital component of the portfolio would include "transition" programs to help move patients out safely and to follow them subsequently. The business case for transition programs would come from a combination of reducing lengths-of-stay and readmissions, which are likely to have more direct penalties from the Centers for Medicare and Medicaid Services (CMS) in the future.

■ **Aggregating the three components.** These three service-line components could be aggregated in any combination, depending on a hospital's circumstances (for example, a hospital without capacity issues might not institute the prehospital component). The three components could be organized separately but ideally are linked, with shared leadership and staffing. Linking the transitions component to the hospital component ensures that patients will have a safe discharge after being moved safely and efficiently through their hospital course. Similarly, transition programs will function most effectively if the program is used early in the care process, and synergistic effects (such as on length-of-stay) beyond the effect of the individual programs might result. Finally, by designing and adopting several of these programs concurrently, start-up and management costs might be reduced and some staffing efficiencies might be attained, while simultaneously broadening the visibility of the initiative and effecting an important culture change toward a chronic-illness orientation throughout an organization.

Estimated Financial Effects Of An Integrated Model

Using data from studies on palliative care, HELP, and Hospital at Home, we have made preliminary estimates for the likely volume of patients and projected cost savings that might result from such a portfolio of services (Exhibit 2). We have highlighted a combination of selected models based on the availability of data that could be used to estimate program costs and potential savings. Also, we did not estimate savings from the posthospital component because the savings depend in part on policy changes (for example, with respect to treatment of readmis-

EXHIBIT 2
Illustration Of The Potential Impact Of A Portfolio Approach For Complex Chronic Illness And Geriatric Patients (Using A 300-Bed Hospital Example)

	Estimated benefits		
Prehospital component: Hospital at Home	**Low**	**Medium**	**High**
Patient cases (percent of total discharges)	2%	3%	4%
Patient cases (cases per year)	405	607	809
Days saved by diversion (LOS x cases)	1,983	2,974	3,966
Increase in net income due to redeployed days[a]	$1,871,860	$2,807,789	$3,743,719
Variable costs of intervention per day net of revenue[b]	($579)	($579)	($579)
Annual costs of intervention	($749,780)	($1,124,670)	($1,499,560)
Increase in net income due to program	$1,122,080	$1,683,120	$2,244,160
Hospital component: Hospital Elder Life Program (HELP)[c]			
Patient cases (percent of total discharges)	6%	8%	10%
Patient cases (cases per year)	1,214	1,619	2,023
Days saved by reduction in delirium	629	839	1,049
Increase in net income due to redeployed days[a]	$594,105	$792,140	$990,176
Savings due to reductions in variable costs	$381,203	$508,270	$635,338
Costs of intervention per case	($200)	($200)	($200)
Annual costs of intervention	($242,804)	($323,739)	($404,674)
Increase in net income due to program	$732,504	$976,672	$1,220,840
Hospital component: palliative care[d]			
Patient cases (percent of total discharges)	2%	4%	6%
Patient cases (cases per year)	405	809	1,214
Days saved not estimated due to lack of data	–	–	–
Savings due to reductions in direct costs per case	$1,196,216	$2,392,432	$3,588,648
Costs of intervention per case net of revenue	($550)	($356)	($356)
Annual costs of intervention net of revenue	($222,571)	($288,128)	($432,192)
Increase in net income due to program	$973,645	$2,104,304	$3,156,457
Summary of impact from three programs			
Patient cases (percent of total discharges)	10%	15%	20%
Days saved (reduced LOS, reduced hospitalizations)	2,612	3,813	5,015
Increase in net income due to redeployed days	$2,465,965	$3,599,930	$4,733,895
Reduction in per case costs (inpatient only)	$1,577,419	$2,900,703	$4,223,986
Costs of interventions net of revenue	($1,215,155)	($1,736,537)	($2,336,425)
Increase in net income due to programs	$2,828,229	$4,764,096	$6,621,456

SOURCES: See below.

NOTES: Illustrations are based on a hypothetical 300-bed hospital with 85 percent average occupancy (representative of hospitals operating at capacity on certain days of the week or in certain units), total discharges of 20,234, length-of-stay (LOS) of 4.6 days (from the 2006 AHRQ/HCUPnet data set, http://hcupnet.ahrq.gov/HCUPnet [accessed 6/30/08]), Medicare discharges of 7,486, Medicare LOS of 5.7 days; and average cost per Medicare case of $10,495.

[a] Contribution margin of $944 per day assumed for value of reduced LOS or increased capacity. F.H. Rubin et al., "Replicating the Hospital Elder Life Program in a Community Hospital and Demonstrating Effectiveness Using Quality Improvement Methodology," *Journal of the American Geriatrics Society* 54, no. 6 (2006): 969–974.

[b] In capitated systems, Hospital at Home savings result from substituting other services for inpatient care. In fee-for-service, reimbursement may be less than program costs. The model assumes a $579 per day cost above billable net revenue. All cases participating result in 100 percent increase in hospital bed capacity due to diversion to home setting.

[c] HELP program reduces delirium cases by 14.4 percent, and LOS was 3.6 days longer for delirium cases. Variable costs were reduced by $2,181 per delirium case or $314 for each intervention case. Rubin et al., "Replicating the Hospital Elder Life Program." Program costs ranged from $91 to $564 per case. Current estimate from program leader is $200 per case.

[d] Palliative care is associated with direct cost savings of $2,956 before expenses. Program costs estimated at $356 per case; higher estimates for the low scenario represent less efficiency due to scale and also variations in revenue. R.S. Morrison et al., "Cost Savings Associated with U.S. Hospital Palliative Care Consultation Programs," *Archives of Internal Medicine* 168, no. 16 (2008): 1783–1790.

"Efforts to build effective models for chronic care cannot ignore the imperative of improving chronic care in the acute setting."

sions) that are currently being debated. The estimate models potential savings and the contribution margin from increased case capacity, as well as program costs, and estimates were made using more conservative ("low" benefit in the exhibit) and less conservative ("high" benefit) assumptions.

We estimated that 10–20 percent of acute care discharges would benefit from a portfolio of services and that such a program would improve costs for that subgroup by 15 percent (this is consistent with savings found in the programs studied). In addition, the prehospital and hospital-based services would create capacity for 568–1,090 additional cases (2.8–5.5 percent of total discharges). For a 300-bed hospital, the combined impact of capacity creation and reductions in cost per day would be $2.8–$6.6 million after accounting for program costs. Although estimates of savings from individual components are evidence-based, the components have not been aggregated and evaluated in this manner. Rigorous evaluation by early adopters of expanded service lines will be needed.

■ **Benefits to society.** Some will ask why insurers and society should participate in the creation of a business case for hospitals and why a business case is necessary from a societal perspective, but we believe that this service line of models will provide important benefits as well to society at large. First, there are direct benefits to patients and families in the form of improved clinical outcomes such as improved functioning (from ACE units and Hospital at Home), decreased complications such as delirium and other iatrogenic complications (from HELP and Hospital at Home), improved symptom management (from palliative care), and increased satisfaction with care and reductions in caregiver burden (from Hospital at Home and palliative care).[23] Second, there are direct economic benefits to Medicare and other payers from reduced admissions (from Hospital at Home), readmissions (from transition programs), and long-term care costs (from HELP).[24] Third, there are additional indirect societal benefits including reductions in ED crowding, in early and inappropriate hospital readmissions, and in costs to the nonhospital sector of care. Fewer hospital beds would need to be built, resources would be freed to build care capacity across the continuum of care, and investments could be leveraged for IT. The proper medical care could be provided in the most appropriate setting with the breaking down of barriers between silos of care. All of these outcomes would reduce health care costs in the acute care sector and make available resources for investments in improving ambulatory care. None of these benefits would accrue, however, unless a business case could be made for hospitals. Efforts to build effective models for chronic care cannot ignore the imperative of improving chronic care for patients in the acute setting.

Concluding Observations

Our preliminary estimates were derived from published data on the component models, and we believe that the estimates are conservative. No assumptions are included about potential economies of scale from aggregating the components. Additionally, it is unlikely that savings from the individual components were "double counted." Savings from the various hospital components were derived in some cases from different patients and in all three cases by different pathways that overlap minimally. The business case includes some savings from reduced lengths-of-stay, savings from lower costs per day, and revenue from backfilling beds by keeping patients out of the hospital to begin with.

■ **Limitations of past cost-saving strategies.** For the past twenty years, hospitals have focused on reducing costs by reducing lengths-of-stay and standardizing the care of uncomplicated admissions. Perhaps lengths-of-stay for these patients can be reduced further, but there may be a limit to such a strategy, as an increasing proportion of patients have conditions that are too complex to fit standard critical pathways and treatment protocols. The unintended consequence of the focus on critical pathways and specialization is that patients with complex chronic illnesses are most at risk for being lost in the system without a navigator, and they are at increased risk for poor outcomes and high resource use.

■ **Generalization of our business case.** It could be argued that we have based our business-case assumptions from innovative care models developed largely at academic medical centers and that these experiences do not generalize. This is true to some extent; however, favorable and comparable experience has been observed when some of these models have been replicated elsewhere (for example, HELP and palliative care). Similarly, program adopters will need to factor in higher program costs associated with start-up and smaller programs. Over time, program costs per case should decrease as programs grow and mature.

■ **Ambulatory versus acute care.** There are those who will argue that ambulatory rather than acute care should be the focus of efforts to improve chronic disease care, given that preventing hospitalization is a precept of good chronic care. We acknowledge that only some parts of chronic illness care can be addressed through the acute care platform and that efforts also need to be directed to improving ambulatory care for chronic disease. However, we argue that patients with chronic illnesses end up hospitalized under the best of circumstances, and there is abundant evidence of the failings of current inpatient care delivery for such patients. In addition, our model does not preclude or inhibit, in any way, the development of chronic illness care in the ambulatory setting. In fact, we believe that if payment reform or initiatives such as the patient-centered medical home are accomplished, our model will create an acute care platform that will be better suited to creating a true continuum of care across the silos that constitute the U.S. health care system.

Patients with chronic illnesses already have an impact on hospitals' financial health, and that impact will continue to grow. Innovative care models exist on which to build a business case for chronic disease programs in hospitals, to the benefit of the hospitals, their communities, patients with chronic illnesses, and the larger society. The timing is right for these programs, given public dissatisfaction with the experience of hospital care for the seriously ill, current bed capacity issues, ED overcrowding, ever-increasing costs and declining reimbursement for Medicare patients, and current and pending Medicare payment reforms. For the foreseeable future, we need to harness the focus and resources available in acute care to deal with the problem of chronic disease while pursuing outpatient innovations and payment reform.

This work was supported by a grant from the Atlantic Philanthropies. Additional support was received from the National Institute on Aging, the Veterans Affairs (VA) Health Services Research and Development (HSR&D) Program, and Retirement and Research Foundation. The views expressed here are those of the authors and do not necessarily reflect the position or policy of the VA.

NOTES

1. J.L. Wolff and C. Boult, "Moving beyond Round Pegs and Square Holes: Restructuring Medicare to Improve Chronic Care," *Annals of Internal Medicine* 143, no. 6 (2005): 439–445.
2. G.F. Anderson, "Better Lives for People with Chronic Conditions" (PowerPoint presentation), 29 November 2000, http://www.partnershipforsolutions.org/DMS/files/anderson_cdc.ppt (accessed 9 September 2008).
3. E.H. Wagner et al., "Improving Chronic Illness Care: Translating Evidence into Action," *Health Affairs* 20, no. 6 (2001): 64–78.
4. J. Arvantes, "Medical Home Gains Prominence with AAFP Oversight," *Annals of Family Medicine* 6, no. 1 (2008): 90–91; and K. Davis, S.C. Schoenbaum, and A.M. Audet, "A 2020 Vision of Patient-Centered Primary Care," *Journal of General Internal Medicine* 20, no. 10 (2005): 953–957.
5. J.L. Wolff, B. Starfield, and G. Anderson, "Prevalence, Expenditures, and Complications of Multiple Chronic Conditions in the Elderly," *Archives of Internal Medicine* 162, no. 20 (2002): 2269–2276.
6. L.P. Sands et al., "Rates of Acute Care Admissions for Frail Older People Living with Met versus Unmet Activity of Daily Living Needs," *Journal of the American Geriatrics Society* 54, no. 2 (2006): 339–344.
7. C.M. Boyd et al., "Guided Care for Multimorbid Older Adults," *Gerontologist* 47, no. 5 (2007): 697–704.
8. Agency for Healthcare Research and Quality, "Weighted National Estimates from HCUP Nationwide Inpatient Sample (NIS) 2006," http://hcupnet.ahrq.gov/HCUPnet.jsp?Id=80DEA8AFC7845796&Form=DispTab&JS= (accessed 30 June 2008).
9. Medicare Payment Advisory Commission,"Medicare Payment Advisory Commission Releases Report on Medicare Payment Policy," Press Release, 13 June 2008, http://www.medpac.gov/documents/Jun08_News_release_final.pdf (accessed 8 October 2008).
10. D.R. Rittenhouse et al., "Measuring the Medical Home Infrastructure in Large Medical Groups," *Health Affairs* 27, no. 5 (2008): 1246–1258.
11. H.J. Cohen et al., "A Controlled Trial of Inpatient and Outpatient Geriatric Evaluation and Management," *New England Journal of Medicine* 346, no. 12 (2002): 905–912.
12. M. Mezey et al., "Nurses Improving Care to Health System Elders (NICHE): Implementation of Best Practice Models," *Journal of Nursing Administration* 34, no. 10 (2004): 451–457.
13. S.K. Inouye et al., "A Multicomponent Intervention to Prevent Delirium in Hospitalized Older Patients," *New England Journal of Medicine* 340, no. 9 (1999): 669–676; S.K. Inouye et al., "Dissemination of the Hospital Elder Life Program: Implementation, Adaptation, and Successes," *Journal of the American Geriatric Society* 54, no. 10 (2006): 1492–1499; E.H. Bradley et al., "Patterns of Diffusion of Evidence-Based Clinical

Programmes: A Case Study of the Hospital Elder Life Program," *Quality and Safety in Health Care* 15, no. 5 (2006): 334–338; and J.A. Rizzo et al., "Multicomponent Targeted Intervention to Prevent Delirium in Hospitalized Older Patients: What Is the Economic Value?" *Medical Care* 39, no. 7 (2001): 740–752.

14. C.S. Landefeld et al., "A Randomized Trial of Care in a Hospital Medical Unit Especially Designed to Improve the Functional Outcomes of Acutely Ill Older Patients," *New England Journal of Medicine* 332, no. 20 (1995): 1338–1344; and S.R. Counsell et al., "Effects of a Multicomponent Intervention on Functional Outcomes and Process of Care in Hospitalized Older Patients: A Randomized Controlled Trial of Acute Care for Elders (ACE) in a Community Hospital," *Journal of the American Geriatrics Society* 48, no. 12 (2000): 1572–1581.
15. R.S. Morrison and D.E. Meier, "Clinical Practice: Palliative Care," *New England Journal of Medicine* 350, no. 25 (2004): 2582–2590; P.L. Manfredi et al., "Palliative Care Consultations: How Do They Impact the Care of Hospitalized Patients?" *Journal of Pain and Symptom Management* 20, no. 3 (2000): 166–173; I.J. Higginson et al., "Is There Evidence That Palliative Care Teams Alter End-of-Life Experiences of Patients and Their Caregivers?" *Journal of Pain and Symptom Management* 25, no. 2 (2003): 150–168; and R.S. Morrison et al, "Cost Savings Associated with U.S. Hospital Palliative Care Consultation Programs," *Archives of Internal Medicine* 168, no. 16 (2008): 1783–1790.
16. M.D. Naylor et al., "Comprehensive Discharge Planning and Home Follow-up of Hospitalized Elders: A Randomized Clinical Trial," *Journal of the American Medical Association* 281, no. 7 (1999): 613–620; E.A. Coleman, "Falling through the Cracks: Challenges and Opportunities for Improving Transitional Care for Persons with Continuous Complex Care Needs," *Journal of the American Geriatrics Society* 51, no. 4 (2003): 549–555; and E.A. Coleman et al., "Preparing Patients and Caregivers to Participate in Care Delivered across Settings: The Care Transitions Intervention," *Journal of the American Geriatrics Society* 52, no. 11 (2004): 1817–1825.
17. See, for example, S. Shepperd and S. Iliffe, "Hospital at Home versus In-Patient Hospital Care," *Cochrane Database of Systematic Reviews,* Issue 3 (2005): CD000356; N. Aimonino Ricauda et al., "Substitutive 'Hospital at Home' versus Inpatient Care for Elderly Patients with Exacerbations of Chronic Obstructive Pulmonary Disease: A Prospective Randomized, Controlled Trial," *Journal of the American Geriatrics Society* 56, no. 3 (2008): 493–500; and B. Leff et al., "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, no. 11 (2005): 798–808.
18. M. Campbell et al., "Framework for Design and Evaluation of Complex Interventions to Improve Health," *BMJ* 321, no. 7262 (2000): 694–696; and B. Leff, "Dissemination of Models of Geriatric Care: Facilitators and Barriers," Presentation to the Institute of Medicine Committee on the Future Health Care Workforce for Older Americans, 28 June 2007, http://www.iom.edu/Object.File/Master/43/860/Bruce%20Leff%20IOM%20Presentation%20SF%2006-28-07%20update.pdf (accessed 27 June 2008).
19. E.H. Bradley et al., "Translating Research into Clinical Practice: Making Change Happen," *Journal of the American Geriatrics Society* 52, no. 11 (2004): 1875–1882.
20. Cohen et al., "A Controlled Trial"; C. Boult et al., "A Randomized Trial of Outpatient Geriatric Evaluation and Management," *Journal of the American Geriatrics Society* 49, no. 4 (2001): 351–359; and K.E. Covinsky et al., "Do Acute Care for Elders Units Increase Hospital Costs? A Cost Analysis Using the Hospital Perspective," *Journal of the American Geriatrics Society* 45, no. 6 (1997): 729–734.
21. Naylor et al., "Comprehensive Discharge Planning"; Coleman et al., "Preparing Patients"; T.J. Smith et al., "A High-Volume Specialist Palliative Care Unit and Team May Reduce In-Hospital End-of-Life Care Costs," *Journal of Palliative Medicine* 6, no. 5 (2003): 699–705; and F.H. Rubin et al., "Replicating the Hospital Elder Life Program in a Community Hospital and Demonstrating Effectiveness Using Quality Improvement Methodology," *Journal of the American Geriatrics Society* 54, no. 6 (2006): 969–974.
22. Morrison et al., "Cost Savings."
23. Landefeld et al., "A Randomized Trial of Care"; Inouye et al., "A Multicomponent Intervention"; Leff et al., "Hospital at Home"; and Manfredi et al., "Palliative Care Consultations."
24. D.L. Leslie et al., "Consequences of Preventing Delirium in Hospitalized Older Adults on Nursing Home Costs," *Journal of the American Geriatrics Society* 53, no. 3 (2005): 405–409; Naylor et al., "Comprehensive Discharge Planning"; and Leff et al., "Hospital at Home."