THE COMMONWEALTH FUND

July 2004

Issue Brief

Translating Research into Practice: Speeding the Adoption of Innovative Health Care Programs

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ABSTRACT: For this study, the authors conducted case studies of four varied clinical programs to learn key factors influencing the diffusion and adoption of evidence-based innovations in health care. They found that the success and speed of the adoption/diffusion process depend on: the roles of senior management and clinical leadership; the generation of credible supportive data; an infrastructure dedicated to translating the innovation from research into practice; the extent to which changes in organizational culture are required; and the amount of coordination needed across departments or disciplines. The translation process also depends on the characteristics and resources of the adopting organization, and on the degree to which people believe that the innovation responds to immediate and significant pressures in their environment.

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BACKGROUND

Researchers devote substantial resources to developing and testing the efficacy of clinical innovations that improve the health of patients and their families. Yet translating such innovations into practice is challenging. There are numerous examples of evidence-based programs and interventions that are only partially adopted into clinical practice,[1–5] if adopted at all.

The failed translation of research into clinical practice has caught the attention of federal agencies and foundations[6,7] that want to support such efforts to improve the quality of care. But in today's cost-conscious and highly regulated environment, there is growing concern over the limited resources available to ensure the adoption of effective and beneficial health care innovations. It becomes all the more important to understand which methods work best.

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This report showcases eight key lessons we learned about the diffusion and adoption of evidence-based innovations from research into practice (Figure 1). These lessons are based on four case studies. In each, innovative clinical programs were developed that were empirically proven to be effective, and then were adopted by multiple health care providers.

THE INNOVATIONS AND THEIR DIFFUSION INTO WIDER PRACTICE

The four cases studies were selected for their diversity in design. The innovations in each study are based on different populations and medical conditions, for example, and differ also in the genesis of their development and diffusion. In each, the innovation is being disseminated to different types of organizations and clinicians, and there is variety in the organizational relationships with the recipients of the innovation.

Hospital Elder Life Program: Reducing Delirium in Older Patients

The Hospital Elder Life Program (HELP) is a multi-component intervention to reduce delirium among older, hospitalized adults.[8] (See http://www.HospitalElderLifeProgram.org.) The program includes six protocols that target the major risk factors for delirium: cognitive impairment, sleep deprivation, immobility, vision impairment, hearing impairment, and dehydration.[9] To implement the program, the recommended resources include a full-time Elder Life Specialist, a part-time advanced practice geriatric nurse and geriatrician, and specifically-trained volunteers who provide targeted interventions. HELP is supported by information technology designed to prompt and document recommended interventions, track patient progress, and report clinical and financial performance.

Figure 1. Key Lessons Learned About Diffusing Innovation into Practice

Lesson #1	The strong support of senior management at the adopting organizations increases the success of adoption.
Lesson #2	Effective clinical leadership in the adopter organizations speeds adoption.
Lesson #3	Data to support start-up, implementation, and ongoing evaluation must be credible and persuasive to those who influence budget decisions.
Lesson #4	The speed of adoption is influenced by the degree to which the innovation requires changes in organizational culture.
Lesson #5	The diffusion process is slowed when the effort requires coordination across departments or disciplines.
Lesson #6	Plan for program sustainability from the start. To speed adoption, create a specific infrastructure with resources and expertise devoted to diffusion.
Lesson #7	The relationship between the dissemination infrastructure and the adopting organizations affects the speed of adoption.
Lesson #8	The perceived ability of an innovation to reduce external threats can influence the speed of its diffusion.

Evaluation data from the controlled trial of HELP indicate that the program reduces episodes of delirium, prevents functional and cognitive decline among hospitalized older patients,[8–11] and is cost-effective for hospitals to implement.

The diffusion process involved 13 original hospitals that implemented HELP with the aid of the Yale HELP dissemination team. The first phase of dissemination was funded by several foundations between 2000–2003. HELP now is being distributed to approximately 24 additional hospital sites.

Wellspring: Improving Quality of Care and Empowering Staff in Nursing Homes

The Wellspring Model was created to improve the quality of clinical care in nursing homes, and to foster a better working environment for nursing home staff. (See http://www.cmwf.org/programs/elders/stone_wellspringevaluation_bn_550.asp.) The core elements of the model include: 1) top management's commitment to quality improvement, 2) a shared program of staff clinical training modules, 3) clinical consultation with an advanced practice nurse, 4) the collection and sharing of comparative data on resident outcomes across alliance members and 5) multidisciplinary care resource teams, including frontline nursing assistants who are empowered to develop and implement interventions that members believe will improve the care of residents.

Formal evaluations of the Wellspring Model found that the combination of clinical improvements and organizational culture changes resulted in slightly lower rates of staff turnover, better performance on federal nursing home survey measures and improved resident-staff interactions. Moreover, implementation of the Wellspring Model required no increase in net resources.[12]

The Wellspring Model originally was implemented by an alliance of 11 free-standing nonprofit nursing homes in Wisconsin. It since has been adopted by four additional nursing home alliances, comprising a total of 50 nursing facilities in Wisconsin and Illinois. The nursing homes pay a licensing fee to Wellspring Innovative Solutions, and receive training and staff support in the clinical education modules; tools for collecting and sharing clinical outcomes data; and access to "user groups" (Directors of Nursing, administrators, and care team coordinators) that are implementing Wellspring in their facility.

Healthy Steps for Young Children: Improving Primary Pediatric Care

Healthy Steps for Young Children is a national initiative to foster the healthy growth and development of children from birth to age three. (See http://www.healthysteps.org.) The approach emphasizes a closer relationship between health care professionals and parents in addressing the physical, emotional, and intellectual growth and development of children in this age group. These topics often are not comprehensively addressed during regular pediatric visits. In this program, a Healthy Steps Specialist, who is trained in child development, offers parents individualized visits and provides educational material on behavioral and developmental issues. The Healthy Steps Specialist becomes a member of the pediatric practice team.

A controlled evaluation of the program showed that Healthy Steps enhances parent and clinician satisfaction with pediatric health care, enhances use of needed developmental services for improved care, and increases the quality of early childhood health care.[13] Of the original 24 sites that implemented Healthy Steps between 1996 and 1998, 11 continue with the program as originally designed, nine have adapted the program substantially, and four no longer implement Healthy Steps. The program has now been disseminated to an additional 24 practices, HMOs, clinics, and residency training programs.

The National Program Office and the Training and Technical Assistance Team assist practices interested in adopting Healthy Steps. The long-term goal is to make behavioral and developmental care a standard for early childhood health

care. The American Academy of Pediatrics is a cosponsor of Healthy Steps.

Fleetwood Project: Reducing Inappropriate Medications in Nursing Homes

The Fleetwood Model is a new model of long-term care pharmacy developed by the American Society of Consultant Pharmacist Research and Education Foundation. (See http://www.ascp.com/public/pubs/tcp/1998/dec/fleetwood.shtml.) It incorporates identification of nursing home residents at highest risk for preventable adverse drug events; pharmacist assessments of the patients; prospective drug regimen review; formalized pharmaceutical care planning; and direct communication between the consultant pharmacist and the prescribing clinician. The Fleetwood Model seeks to reduce the prevalence of potentially inappropriate medication use, the potential under-treatment of common diseases experienced by residents in nursing homes, and the rate of potential adverse drug events in nursing homes.

Pharmacoeconomic models that quantify the impact of the Fleetwood Model estimate significant cost savings and increased quality of care related to the reduction of drug-related morbidity and mortality in nursing homes.[14] The feasibility of implementing the Fleetwood Model is well-documented.[15] The project initially began in three nursing homes in Wisconsin, and has since been disseminated to 13 additional nursing homes in North Carolina.

A CONCEPTUAL FRAMEWORK AND LESSONS LEARNED ABOUT DIFFUSING INNOVATIONS IN THE CLINICAL SETTING

Our conceptual framework suggests a number of factors that may influence the successful adoption of innovations by organizations. Some of these factors have been described in previous literature on diffusion.[5,16,17] These factors can be grouped in four broad domains: 1) the adopting organization, 2) the innovation, 3) the dissemination infrastructure, and 4) the external environment or context (Figure 2). This framework does not address each factor's relative contribution to success.

The four diverse case studies revealed pathways for treating the diffusion and subsequent adoption of innovations, and shared successful steps for translating innovations into clinical practice. Based on these shared characteristics, we developed a set of "best practices" for diffusing new, evidence-based programs into clinical practice (Figure 3).

1. The strong support of senior management at the adopting organizations increases the success of adoption.

In all four cases, the role of senior management was central to the successful adoption of the innovation. In HELP, administrative support was needed both to obtain financial support for program staff, and to advocate internally and externally for the program. In the Wellspring model, clinicians (advanced practice nurses and nurse coordinators) were the primary facilitators of the innovation. But the clinicians could not have succeeded without the support of nursing home administrators and their boards of directors, who facilitated the broader management changes required to implement clinical improvements. In the Fleetwood Model implementation, senior management support was critical for reengineering the pharmacy, adding technological advances, and retaining Fleetwood Model pharmacists. Similarly, without the support of senior management, the added cost of a Healthy Steps Specialist could not be funded, nor could the program be promoted.

2. Effective clinical leadership in the adopter organizations speeds adoption.

Clinical leaders who are both credible to clinicians and savvy about organizational dynamics can champion the new program and thus speed its adoption. These clinicians, however, must commit to undertaking a lengthy process that can involve resistance to change from their peers, as well as the transformation of the organization's cultural

Figure 2. Conceptual Framework: Factors That Determine the Rate of Adoption of Innovations from Research into Practice

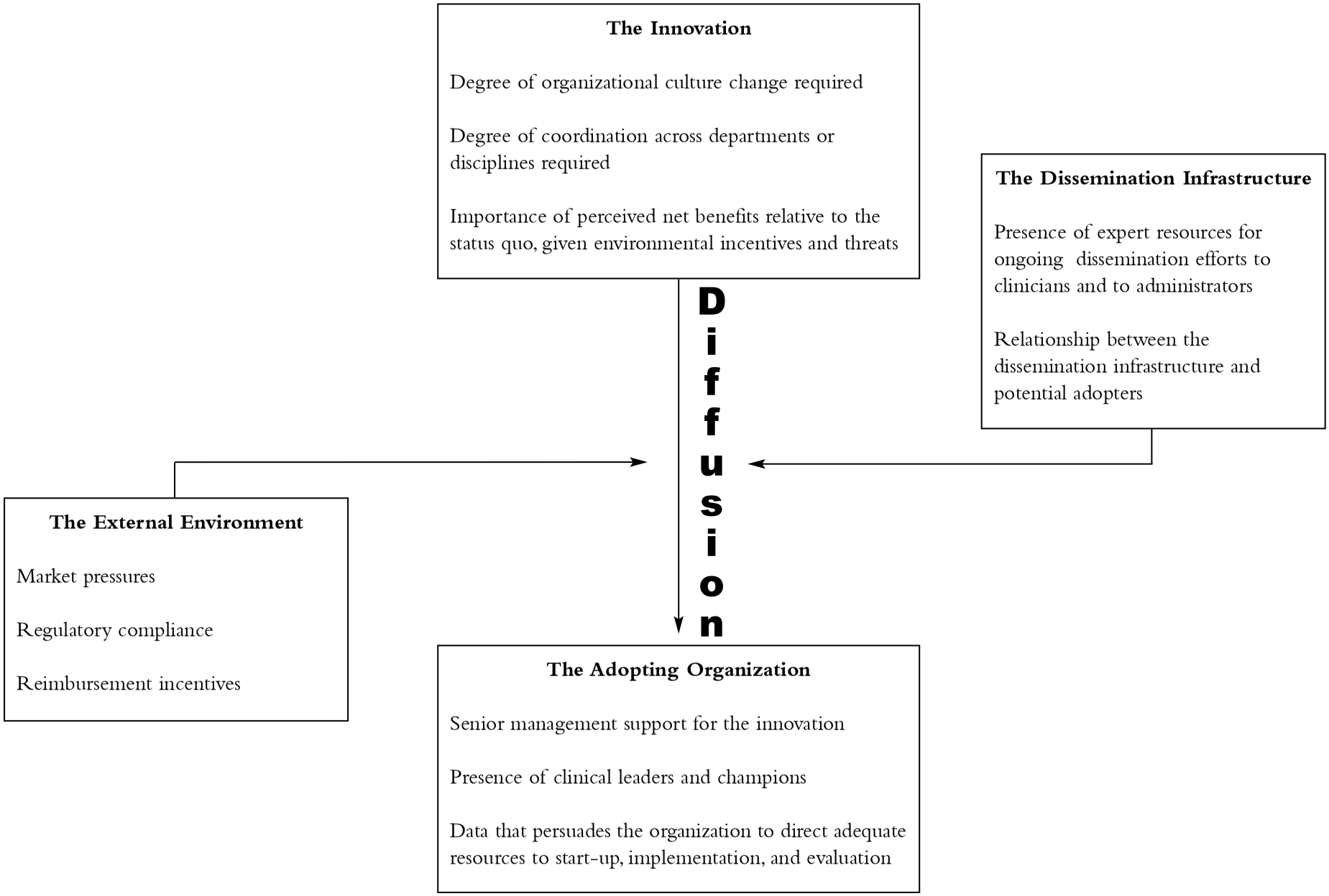

Figure 3. Best Practices to Speed the Translation of Evidence-Based Innovations in Clinical Practice, Based on Four Case Studies

Best practice #1	Target diffusion efforts toward organizations that have or can develop strong senior management support for adoption of the innovation.
Best practice #2	Identify and support clinical champions in the adopter organization who can enhance buy-in from clinicians.
Best practice #3	Develop simple methods of collecting and reporting data that will be credible to the organization, and that demonstrate the program is fulfilling the organization's strategic goals.
Best practice #4	Expect the diffusion to take longer if it involves changes in the adopting organization's culture or extensive interdepartmental collaboration.
Best practice #5	Plan for sustainability from inception, and invest adequately in the infrastructure needed to manage the dissemination and diffusion process.
Best practice #6	Anticipate changes in the external environment and demonstrate how the innovation can help the organization adapt to market and regulatory pressures.

norms. Clinical leaders enlisted the support of other clinicians in embracing the innovation, a strategy that was a critical component to the program's success. With Healthy Steps, in fact, clinician support sometimes was more critical than administrative support.[18, 19]

In all four case studies, there were one or more strong champions who acted as change agents, were central to the initial adoption, sustained implementation, and diffused the innovation to additional organizations or settings.

3. Data to support start-up, implementation, and ongoing evaluation must be credible and persuasive.

Many administrators are influenced by solid science published in leading peer-reviewed journals; such information often helps propel and sustain organizational adoption of innovations from research. Evidence-based practice is in vogue, and peer-reviewed evidence of improved quality or the benefits of an innovation certainly made clinicians and staff more interested in adopting the program.

Such published scientific reports, however, can be insufficient motivation for some executives. Frequently, it was important to prove that the program delivered financial benefits to the institution or local environment. For many administrators, it was far more important to be able to understand the kind of evidence that can motivate change.

Making a "business case" to people who control the budget requires different language and data from that used to craft a "clinical case" or "quality improvement case." Administrators may be more impressed by results drawn from their own organization than by data published in peer-reviewed journals. While a publication in a widely respected peer-reviewed journal is helpful, a carefully chosen case study can also be effective in garnering and retaining support for programmatic changes. It is essential to show how the innovation, if successfully adopted and sustained, fulfills the strategic business goals of the organization.[19]

4. The speed of adoption is influenced by the degree to which the innovation requires changes in organizational culture.

In three of the four cases, no matter how simple or evidence-based a change in practice seemed, adopting the innovation meant altering

fundamental beliefs, norms, and values embedded in the organization. In the case of HELP, implementing interventions meant taking a different view of the care of frail older patients. It meant integrating volunteers into the care process for the first time, as well as increased collaboration across disciplines. To effect each of these changes, staff members had to think differently about their roles, their goals, and their interrelationship with other departments and disciplines.

In the case of the Wellspring Model, it upset the "established order" to empower frontline care staff to participate in decision-making. It required strong support at all levels of the organization to avoid undermining this process. Similarly, Healthy Steps involved substantial alteration of the norms of pediatric or family practices. The model required a new understanding and acceptance of a team approach that integrates behavioral and developmental care more fully into pediatrics.

In contrast, the Fleetwood Project required a remodeling of the pharmacy function more than sparking an organizational culture change. Dispensing pharmacists were asked to intervene prospectively with nursing home patients, as well as to communicate directly with the prescribing clinicians. Effective implementation required both extensive training to enhance their communication skills, and technological enhancements to facilitate sharing of medication plan data among dispensing and consulting pharmacists. Nevertheless, the project can be implemented relatively independently by the patient care unit staff, limiting the scope of the organizational change and cultural adaptation required.

5. The diffusion process is slowed when the effort requires coordination across departments or disciplines.

The HELP and Wellspring models required extensive coordination across disciplines and among departments. Healthy Steps, however, was implemented as an added service to existing pediatric practices and required less collaboration and interdisciplinary work. Program personnel, however, believe that adding the integration of pediatrics and obstetrics/gynecology staff would have greatly facilitated program success.

Similarly, the Fleetwood Model required extensive collaboration among dispensing and consulting pharmacists who usually did not communicate regularly. But it did not require collaborations across additional departments within the adopting organizations.

Innovations that require the formation of a cohesive team across departmental lines can be particularly challenging. Such programs require commitments of staff from a wide array of departments. But once the program is organizationally assigned to one department, other departments may feel less ownership of the program, and therefore less commitment to its success. Another problem is that multidisciplinary programs can be at risk when individual departments are forced to make a choice between budgeting for their core responsibilities, and programs that seem more peripheral and therefore less important.

6. Plan for program sustainability from the start by creating an infrastructure for diffusion.

The process of embedding new methods takes longer than most people expect. There should be a plan in place from implementation to sustain the program. Typically, a program extends beyond one fiscal year, and can stall or stop altogether if it is not adequately resourced.

Diffusing a program that requires organizational change is a full-time effort that must be backed by substantial resources. A typical diffusion infrastructure should include resources to accomplish the following: recruit new sites that might adopt the program; market the new program; educate staff and administrators about the new program; answer questions when implementation problems occur; and provide expert advice about ways to sustain the program. This extensive infrastructure is expensive, but critical.

In the cases we reviewed, dissemination and diffusion required more dedicated staff resources and infrastructure than expected. For example, Wellspring Innovative Solutions has inadequate resources, yet the program still has tried to manage the expectations and support needs of 50 nursing homes and five distinct alliances. The program halted further diffusion until it could obtain additional financial and staff resources to support the infrastructure it needed to manage these efforts.

The experiences of HELP and Fleetwood Model have been similar. In both, the success of diffusion depended largely on a staff funded specifically to disseminate the programs.

The diffusion process of Healthy Steps has been less formalized. The Healthy Steps National Program Office at ICF Consulting, along with the Healthy Steps Training and Technical Assistance Team at Boston University School of Medicine, provide technical assistance to new sites. Their efforts have been critical to the spread of the innovation.

In general, there must be adequate support for the dissemination and diffusion process. Otherwise, diffusion tends to slow unless the organizations are motivated to adopt the innovation because of regulatory and market incentives.

7. The relationship between the dissemination infrastructure and the adopting organizations affects speed of adoption.

In each of the four case studies, there was a different relationship between the organization and the potential adopters of the innovation. Despite these dissimilarities, it remained true that the relationship of the dissemination infrastructure to the adopting organizations influenced the speed of adoption.

In the case of the Wellspring Model, an alliance of nursing homes created the model. The relationship between this charter alliance and subsequent adopters was very close and contractually binding. The closeness of the relationship built a sense of mutual commitment to the innovation, and created momentum for change and adoption in the broader nursing home industry.

Healthy Steps, however, took on a different approach to diffusion and technical assistance. Each medical practice, community health center, or residency training program was its own entity completely distinct from the Healthy Steps Program Office. As a result, there was a greater distance between the disseminating agency and the adopting agency, and this distant relationship made diffusion more challenging.

8. The perceived ability of an innovation to reduce external threats can influence the speed of its diffusion.

Adopters of the four innovations all perceived external threats that were real, immediate, and significant to their survival. But they differed by the degree to which they addressed these external threats.

In the most extreme cases, the external threat of regulatory compliance was the primary motive for the organization to adopt innovative processes. The Fleetwood Project fills a clear need, driven by the external threat of regulatory requirements, to implement a drug review process. Nursing homes are required by the Center for Medicare & Medicaid Service (CMS) to have some form of external pharmacy review. Without such a process of review, nursing homes can lose their ability to be reimbursed by Medicare and Medicaid, both critical to an organization's survival.

Similarly, the Wellspring Model program demonstrated that nursing homes adopting its principles and strategies were less likely to score deficiencies on federal nursing home surveys. This quality is a critical determinant of organizational survival; nursing homes with substantial deficiencies must either correct these problems, or close.

Regulatory compliance compelled organizations to adopt processes promoted by the Fleetwood

Project and the Wellspring Model. In Healthy Steps and HELP, however, the motivation was better patient care for pediatric and older populations, respectively. The key difference is that improving patient care is laudable and expensive, but it is not essential to an organization's survival.

Both Healthy Steps and HELP require additional clinical processes that are not explicitly reimbursed. Therefore, organizations that choose to adopt these innovations must be motivated by a strong desire to improve. They do not run the risk of compromising organization survival if they choose not to adopt the innovation. The cost—or risk—of inaction may be perceived as less severe in such cases. Regulatory compliance is not at stake, and the organization itself is not threatened by non-adoption.

SUMMARY

We examined four diverse health care programs that diffuse innovation into practice settings. Our study revealed important lessons on how to speed along the translation process. First, the roles of senior management, clinical leadership, and credible data are important to success. Second, diffusion does not occur spontaneously. It requires the creation of an infrastructure dedicated to translating the innovation from a research setting into a practice setting. Finally, specific features of the innovation and the diffusion effort are central to the speed and success of diffusion. The translation process also depends on the characteristics and resources of the adopting organization, and on the degree to which people believe that the innovation responds to immediate and significant pressures in their environment.

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The Commonwealth Fund is a private foundation supporting independent research on health and social issues. The views presented here are those of the authors and should not be attributed to The Commonwealth Fund or its directors, officers, or staff.

This research was supported by grants from The Commonwealth Fund, the Fan Fox and Leslie R. Samuels Foundation, the Retirement Research Foundation, and the Claude D. Pepper Older Americans Independence Center at Yale University. Drs. Bradley and Inouye are supported in part by the Patrick and Catherine Donaghue Medical Research Foundation. Dr. Inouye is also supported in part by grants from the National Institute on Aging.