Strengthening Research to Improve the Practice and Management of Long-Term Care

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CHRONIC DISEASE AND DISABILITY AFFECT Americans of all ages, and millions rely on long-term care (LTC) services—in nursing facilities, in congregate residences, or at home—to meet their health and personal assistance needs. People who are 65 years old today have about a 40 percent chance of spending some time in a nursing home before they die (Kemper and Murtaugh 1991; Murtaugh, Kemper, and Spillman 1990). Almost three-quarters will have had some experience with home care (Stone 2000). The numbers of people, both young and old, in need of long-term care are growing. Changing demographics, a more engaged public, and growing cost pressures are increasing the demand for empirical evidence of the effectiveness and cost effectiveness of alternative LTC approaches and practices.

Making the formal LTC system more effective and more efficient requires that research play a more prominent role in informing service delivery. The research agenda should both respond to and push forward the field of practice, and the definitions of appropriate topics should come from both the practitioners and the researchers. This article uses examples, chosen for illustrative purposes, from both research and practice to demonstrate how past investments in LTC research have helped improve the quality of care and the quality of life for LTC recipients and to suggest how future investments can strengthen the contributions of such research in the years ahead.

The Milbank Quarterly, Vol. 81, No. 2, 2003
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350 Main Street, Malden, MA 02148, USA, and PO Box 1354,
9600 Garsington Road, Oxford OX4 2DQ, UK.

This article is divided into five sections. In the first two, we delineate the scope of research on LTC service delivery and discuss in conceptual terms how research can be expected to influence care practices. In the third, we examine how well research has addressed a series of critical questions posed by LTC managers and practitioners. In the fourth, we discuss the challenges of translating LTC research into practice. Finally, we present a series of recommendations intended to promote the production of useful LTC research, its dissemination to key decision makers, and its translation into practice.

What Is the Scope of LTC Practice Research?

Research on LTC service delivery is a multidisciplinary field of scientific investigation that focuses on identifying the most effective ways to organize, manage, and deliver high-quality LTC and to produce an optimal quality of life and other outcomes for those who require ongoing care for chronic illness and/or disability. It is a subset of health services research (HSR), which encompasses research on all types of health care delivery and includes both policy and practice domains. (The large body of LTC *policy* research is not the subject of this article, although some aspects inevitably overlap.) LTC practice research shares many of the characteristics and problems of HSR in general, and it also adds a few of its own. Like HSR, it seeks to influence and is influenced by both managerial and clinical practices, which are marked by distinctive traditions, disparate research methods, and divergent perspectives on the centrality of research to practice. Unlike most HSR, however, LTC research sits on the border between what has been traditionally viewed as medical care (a term broadly used to include nursing and related disciplines as well as medicine) and social or supportive care. Whereas HSR implies the provision of therapeutic and curative services, LTC implies compensating for dependency in as “normal” a manner as possible with little or no expectation of changing the underlying problem that caused the dependency.

Because it combines elements of medical care with those of supportive or custodial care, LTC is an even more diffuse concept than health care. In LTC, as in health care overall, elements of technical quality vie with concerns about the broader aspects of what has come to be called “quality

of life.” However, because the recipients of LTC are often on a downward trajectory and their full recovery of health and function is unlikely, LTC has commonly been regarded as an unproductive social necessity. The heroic, “rescue” aspects of medical care thus confer on it greater prestige than that accorded to LTC, and the field of LTC research reflects its absence.

Finally, like HSR in general, LTC research traverses imprecisely demarcated institutional and organizational territory. Traditionally, LTC has been identified by the site of service, even though the same services can be provided in various venues. Usually the public equates LTC with care provided in a nursing home or by a visiting nurse association or other home health agency. But LTC also is provided by a wide variety of other organizations, ranging from local housekeeping agencies and aide registries to community-based residences, including “board and care” homes, assisted living facilities, continuing care retirement communities, and the like. To complicate things further, not all care provided by home health agencies and nursing homes is technically LTC. The area of “postacute” care (PAC) has taken on new salience with changing government and market incentives and the growing pressure to shorten hospital stays. Nearly all home health agencies and many nursing homes now also serve relatively short-stay patients, providing PAC to facilitate posthospital rehabilitation, address the short-term exacerbations of chronic conditions, and/or help people develop the skills to manage chronic conditions on their own. Thus a significant challenge for LTC researchers is differentiating among settings, populations, care needs, care objectives, and interventions to maximize the relevance and precision of their work.

How Can Research Contribute to Better LTC?

LTC research can affect practice in four main ways: (1) by developing new concepts and methods that help define fundamental goals, (2) by designing practical tools that document the nature and magnitude of problems to be addressed and the outcomes that are achieved, (3) by assessing interventions and strategies for improving care, and (4) by evaluating new models, programs, or systems of service delivery.

Defining the Goals

By developing new concepts, theories, and methods, research can define the fundamental problems and needs toward which LTC is directed. Such work can be thought of as basic research in the context of LTC.¹ It often grows out of an investigator's scientific curiosity about a particular problem, aspect of care, or observed outcome. Examples are concepts that define the range of needs for assistance with activities of daily living or instrumental activities of daily living, theories that seek to identify the causes of disability, and measures of quality of life or caregiver burden.

Documenting and Describing Problems and Outcomes

Applied research can develop practical tools, derived from more basic investigation, to assess and document the nature, extent, and impact of selected problems or unmet needs; or to assess the outcomes of care. Assessment has become a central part of LTC (Kane and Kane 2000a), and a large body of research has developed age, condition, and problem-specific measures to undergird—and sometimes evaluate—the care of particular individuals and populations. Examples of broad-ranging tools include the Resident Assessment Instrument (RAI) for nursing home residents, the Outcome and Assessment Information Set (OASIS) for home health care, and the variety of comprehensive geriatric assessment instruments used to determine the needs of frail elders. More narrowly focused tools range from instruments designed to recognize cognition, depression, or other problems in older populations to instruments designed to capture preferences and values to those that assess satisfaction with particular kinds of services.

Developing and Testing Clinical Interventions

Research can design and test new clinical interventions and assess the impact of introducing or changing a discrete service or care practice. Determining the impact of such interventions is difficult for several reasons. Both long-term care and long-term care quality are often hard to define precisely. Perceptions of quality are multidimensional, and beliefs about the relative importance of the technical versus interpersonal aspects of care, as well as preferences for particular clinical, functional,

and psychosocial outcomes, vary by the discipline of the practitioner and the circumstances of the LTC recipient. In addition, the nature of the interventions to be tested is sometimes difficult to pin down. What works in one context may not be as effective in another. The nature of the problem being addressed also may change subtly from one setting to another. The organization may change the way in which the intervention is applied. Or the environment may lack a critical ingredient for implementing the intervention effectively. Although translating empirical evidence into practice is difficult in any clinical situation, it may be more difficult for LTC because the boundaries and service definitions are less precise. Nonetheless, it is necessary for systematic improvement.

Evaluating Organizational Innovations

Research can empirically evaluate new models, programs, or systems of service delivery. While researchers themselves may sometimes redesign programs and originate demonstration projects, leaders in the service delivery community more often are the architects of innovation. When this is the case, the role of research is to conduct external evaluations of the effectiveness and/or cost effectiveness of changes in service organization or delivery that may already have supporters pressing for their continuation in advance of evaluation findings. In either case, the perceived relevance and credibility of the evaluation are enhanced when the evaluators and the evaluated have had ample opportunity to develop a common understanding of their respective goals and the measures to be used in determining the innovation's impact.

What Kinds of Information Do LTC Practitioners and Managers Want or Need, and Where Do They Get It?

Practitioners and managers regularly ask a wide variety of questions that they expect—or want—research to address. Here we have organized them into four broad categories: (1) questions about the fundamental goals of care, (2) questions about making care more effective, (3) questions about using resources more efficiently, and (4) questions about new programs, models, and systems of care.

Defining Fundamental Goals

Goals for LTC are derived from a combination of what practitioners and managers believe is important to address—based on their own values and the perceived values of clients and families, payers, regulators, and boards of directors—and what they believe can be achieved. Research has elucidated a wide range of individual, familial, and societal goals. Some are compatible and complementary, while others may require compromise and trade-offs (Benjamin 1999; Kane 1999). Individual goals include improving or maintaining clients' health (or at least slowing the rate of decline), maximizing their function, meeting their basic needs for help with daily activities, promoting comfort and freedom from pain, ensuring their safety, providing choice, and allowing them to remain at home despite significant impairment. Societal goals range from promoting wide access to affordable services to targeting those most in need, cutting costs, and maximizing individual and familial—as distinct from public—responsibility.

Research focusing on the central role of unpaid, usually family, caregivers poses questions about familial goals and has taken several directions. Some studies have examined informal care in order to understand its dynamics (Pearlin and Zarit 1993; Zarit and Pearlin 1993; Zarit and Toseland 1989). Others have emphasized the adverse effects of caregiving on the caregivers themselves (Aneshensel, Pearlin, and Schuler 1993; Lawton et al. 1991; Montgomery, Gonyea, and Hooyman 1985; Pearlin et al. 1990) and have examined ways to give caregivers more tangible assistance (Hepburn et al. 2001; Ostwald et al. 1999; Teri 1999). Some work has even suggested that informal caregivers may impede the patient's recovery by concentrating on comfort rather than restorative care (Penrod et al. 1998).

Given the many possibilities, providers typically turn to research to shed light on the clinical and technical aspects of LTC. In turn, research has had its deepest, most pervasive, and most proactive impact on the goals of LTC through the constructs and terms it has used to frame these questions and through the expectations it has established for achievable outcomes. Probably the single most important research-based concept underpinning LTC is the measure of activities of daily living (ADLs). The best-known measure of ADLs in this country was created by Katz (Katz et al. 1963). In other countries, measures like the Barthel Index are more commonly used (Mahoney and Barthel 1965). A number of variations

of the ADL scale have emerged, some designed to fit specific areas of practice like rehabilitation, which created the Functional Independence Measure (FIM) (Keith et al. 1987).

The Katz ADL scale holds a special place in LTC research history because it defined a concept that has become the backbone of LTC practice. This scale gave operational meaning, and therefore greater credibility, to the concept of functional status. Indeed, much of LTC is directed toward either ameliorating the effects of disability or addressing the underlying process in the hopes of slowing (or even reversing) the disability. The ADL scale has provided a vocabulary around which to frame this work. In many respects, this achievement is equivalent to Freud's work in establishing a conceptual framework in psychiatry. Even Freud's detractors used his terminology to communicate their ideas.

The ADL research has been followed by a series of refinements. The basic performance represented by ADLs has been extended to instrumental activities of daily life (IADLs), which comprise slightly more complex tasks that require cognitive as well as physical abilities (Lawton and Brody 1969). Further refinements have included developing performance measures (Kuriansky and Gurland 1976; Reuben and Siu 1990) and measures that reflect more advanced functions (Fried et al. 1996; Siu, Reuben, and Hays 1990). These measures have in turn been incorporated into standardized tools, such as the Minimum Data Set (MDS) for nursing homes and the OASIS for home health agencies, discussed later in this article.

Research has conceptualized outcomes for LTC clients and provided tools to assess the various domains that constitute these outcomes (Kane, Bell, Riegler, Wilson, and Kane 1983), recognizing that different constituencies may value these outcomes differently (Kane, Bell, and Riegler 1986). A major conceptual breakthrough in understanding the value of LTC and measuring its accomplishments is the recognition that achievements in this area may be gauged by slowing the rate of decline, as well as improving the client's status (Kane, Bell, Riegler, Wilson, and Keeler 1983). Because the natural course of most LTC clients is gradual decline, much of the benefit of good care is clinically invisible. An accurate definition of good LTC, therefore, is a patient's doing better than he or she would without this care. In effect, slowing the rate of decline represents a major accomplishment. The only way to appreciate this effect is to compare the actual and expected clinical courses. The concept of an expected course is a direct extension of research principles.

Raising expectations for LTC and the kinds of interventions that should be incorporated into daily practice is another important contribution of LTC research. The work of Schnelle and his colleagues, for example, demonstrated that carefully training nursing home staff to provide more precise behavioral interventions can lead to dramatically improved results for patients with urinary incontinence (Ouslander, Al-Samarrai, and Schnelle 2001; Schnelle 1990; Schnelle, Cruise, Alessi, et al. 1998; Schnelle, Newman, and Fogarty 1990; Schnelle et al. 1993). Other research has shown that even modest exercise training and nutritional supplementation can significantly improve the function and outlook of residents who were thought to be beyond rehabilitation (Fiatarone et al. 1994; Singh 2002). This work has led to advances in understanding what can be achieved for the frailest, most dependent of LTC clients and inspired others to reevaluate their care of this client population.

Likewise, a series of studies has demonstrated that the established policies dictating the physical and chemical restraint of nursing home residents were in fact counterproductive (Evans, Strumpf, and Williams 1991; Kane et al. 1993). This work supported the argument that eliminating restraints would make care more humane without increasing the risk of falls and injuries.

Another important example of how research is shaping expectations can be seen in the work regarding postacute outcomes for individuals with conditions such as hip fracture, stroke, chronic obstructive pulmonary disease, and heart failure. Although many nursing homes are now delivering PAC, the care is quite different from the more custodial care they have usually provided. Research in this area has pointed to the quality problems that can result from substituting one venue of care for another, illustrating the dangers of confusing the site of care with the nature of the service needed (Kane et al. 2000; Kane et al. 1996; Magaziner et al. 1990). Evidence also has begun to emerge identifying what types of PAC settings are associated with better outcomes for people with various clinical problems (Kane et al. 2000; Kramer et al. 1997).

These studies do not provide comprehensive or definitive answers to questions about the results of different settings, services, and practices for particular clients, client populations, or conditions. They do, however, demonstrate the role of LTC research in framing the basic questions and providing useful findings. These studies also raise questions about the effectiveness of care and the evidence base that underlies practitioners'

decisions for individual clients, as well as managers' decisions about systems and strategy for agencies, institutions, or plans.

Enhancing Effectiveness

Nearly every time a practitioner meets a client, he or she makes two judgments, implicitly or explicitly. The first is about the client's presenting problems, conditions, or perceived needs. The second is about the appropriateness of a particular action or strategy to improve the situation, or at least not to make it worse. At the organization level, effectiveness questions commonly ask about designing and implementing systems that support effective decision making by practitioners, targeting clinical resources to yield maximum benefit, and promoting high-quality care.

Assessing the Client. Assessment can play two roles: (1) determining eligibility for coverage and (2) providing the basis for care. Because our purpose is to show how research can improve care delivery, we focus here on the latter. Assessment for the purpose of planning care differs from medical diagnosis, although both have implications for the type of treatment(s) to be provided. Medical diagnosis is a process of classification intended to identify one or more discrete diseases or conditions for the purpose of ordering treatment or, when there is no effective treatment, offering a prognosis that will allow a patient to plan for the predicted outcome (Kane and Kane 2000b). An assessment is a broader appraisal, at its best designed to capture not only key personal attributes, conditions, and preferences but also external elements—such as the individual's physical environment and informal support system—that may be important to effective LTC planning.

LTC research has facilitated care management by developing many practical tools for assessing clients and their outcomes. Measures of ADL and IADL functions are so numerous that at least one observer has proposed a moratorium on new tools in favor of clarifying the properties and merits of the existing ones (Kane and Kane 2000a). Assessment of physiologic functioning is an area replete with practical tools for classifying client conditions and problems, such as risk of falls, pressure sores, pain, incontinence, or sleep-related problems. Relatively simple tools that practitioners can use to make more reliable judgments about their clients also have been developed in areas like geriatric depression, with the Geriatric Depression Scale (Yesavage and Brink 1983), and in

cognition, with the Mini-Mental Screening Exam (MMSE) (Folstein, Folstein, and McHugh 1975). With growing public interest in LTC users' quality of life (QoL), attention is now turning to developing specialized QoL tools for nursing home residents, recipients of home- and community-based services, and those residing in assisted living facilities.²

Nowadays, most service delivery organizations use standard assessment tools to help practitioners make the observations and inquiries necessary to plan their clients' care. In some cases the assessment instruments adopted and adapted by LTC organizations are specific to the organization, are clinically based, and do not have strong conceptual or psychometric frameworks. Other organizations use the research-based tools as is. All Medicare- and Medicaid-certified nursing homes and home health care agencies—the two sets of organizations that provide the bulk of institutional and at-home care to disabled persons—are required to use uniform research-based assessment tools developed for each industry. Nursing homes must use the MDS (Minimum Data Set) (Hawes, Mor, et al. 1997; Hawes, Morris, et al. 1997; Morris et al. 1990), and home health agencies must use the OASIS (Outcome and Assessment Information Set) (Shaughnessy, Crisler, and Schlenker 1997). Although the MDS was originally developed for nursing homes, its developers modified it for home care and postacute care (Morris et al. 1999; Morris et al. 1997), and even as the basis for hospitals' discharge planning.

The MDS and the OASIS differ in that the former was developed specifically for proactive care planning, whereas OASIS was developed to support quality assurance efforts based on information about patients' discharge outcomes. As part of its care-planning armamentarium, the MDS includes a series of RAPs (resident assessment protocols) and CAPs (client assessment protocols) that “trigger” specific care problems growing out of the basic assessment. These are intended to support the care planner's decision about whether a particular component of care or intervention is needed. In contrast to the MDS, the OASIS was not designed to be a comprehensive stand-alone assessment tool. Rather, home health agencies are directed to incorporate its elements into whatever fuller assessment tool they use to help their nurses and therapists plan care for specific patients. Nonetheless, like the MDS, the OASIS includes a broad range of items designed to judge the functional, cognitive, physiological, behavioral, and psychosocial status of clients in need of service.³

Both the MDS and the OASIS benefited from earlier research that produced the many functional and physiological measures that preceded them, although neither one directly incorporated any of the established measures. Instead, researchers adapted them to specific settings to promote more ready acceptance by practitioners. In addition, both the MDS and the OASIS—and especially the MDS because of its greater longevity—have created their own methodological research addressing the validity and reliability of the component measures (Gruber-Baldini et al. 2000; Teresi and Holmes 1994, 1997; Teresi, Lawton, and Holmes 1994) and the usefulness of the instruments overall for assessing LTC needs in the real world (Fries et al. 1997; Rantz et al. 1999). While the reliability of component measures in both instruments has been reasonably high in the aggregate (e.g., for all facilities in a nursing home sample), questions have been raised about the accuracy and reliability of underlying data at the level of *individual* facilities and organizations (GAO 2002a, 2002b, 2002c), and the Centers for Medicare and Medicaid Services (CMS) is implementing a national MDS accuracy review program (GAO 2002c).

Targeting to Reduce Risk or Enhance Benefit. For sophisticated practitioners, as well as for managers responsible for the care of enrolled populations, an important part of assessment is not merely collecting accurate data to understand clients' conditions or problems but also targeting clinical resources to yield maximum benefit. Most frequently, individuals or groups of clients are targeted whose constellation of characteristics may put them at risk of additional problems if special action is not taken. Less frequently, managers and practitioners may look to targeting as a guide to when they should not intervene.

A number of predictive tools (i.e., algorithms that rely on client-specific clinical and functional data to identify individuals at risk of adverse outcomes) have been developed by the research community for better targeting. Clinical research suggests that a few simple tests, such as walking speed and the ability to rise from a chair unassisted, can predict the likelihood of adverse events such as elders' hospitalization (Gill, Williams, and Tinetti 1995). Review of studies using multidimensional geriatric assessment—including evaluation of medical, functional, psychosocial, and environmental domains—to target home visitation programs has shown that together the tools and the interventions can delay decline in functional status in older persons with relatively good function at baseline (Stuck et al. 2002). The screening instrument most widely

used by managed care organizations is the Pra tool developed to identify individuals at high probability of repeated admissions to a hospital (Boult et al. 1993). As of 1998, more than 170 organizations were using this instrument to identify high-risk Medicare managed care enrollees for whom intervention was deemed appropriate to prevent avoidable hospitalizations (Boult, Boult, and Pacala 1998).

Developing and Implementing Effective Plans of Care: What Works for Whom? Assessment and targeting alone do not result in optimal care unless they are linked through the care-planning process to the implementation of effective interventions (Applegate and Burns 1996; McVey et al. 1989; Silverman et al. 1995; Solomon 1988; Urdangarin 2000). Assuming perfect or even good assessment information, developing an optimal plan of care for a LTC client or optimal strategies for managing a client population poses more questions, to which practitioners and managers seek answers based on research evidence. In figuring out how best to care for their clients, practitioners ask questions that can best be summarized as requesting information about what works best for whom. For example, what regimens are most effective in managing urinary incontinence, preventing pressure sores, or preventing the exacerbation of symptoms associated with heart failure, diabetes, or chronic obstructive pulmonary disease?

Answers to such questions can be found in LTC-specific intervention studies, as well as in more general health services or clinical research whose findings are applicable to specific LTC populations and problems. In nursing homes, for example, researchers have used methodological advances in both LTC and behavioral research to conduct intervention studies focused on three ADLs—toileting, mobility, and dressing (Beck et al. 1997; Colling et al. 1992; Creason et al. 1989; Hu et al. 1995; Lange-Alberts and Shott 1994; Rogers et al. 1999; Schnelle, Keeler, et al. 1995; Schnelle, MacRae et al. 1995; Schnelle, Newman, and Fogarty 1990; Schnelle et al. 1993; Van Ort and Phillips 1995; Wunderlich and Kohler 2001). These studies have reported consistent positive results and have helped re-infuse this neglected area of practice with a new sense of what is possible. Yet changing clinical practices based on research evidence is not simple (Grimshaw and Russell 1993; Grimshaw et al. 2001; Gross et al. 2001). Such changes also are difficult to implement, and sustain, outside tightly controlled experimental settings can also be difficult (Blumenthal and Kilo 1998; Casalino et al. 2003; Grimshaw and Russell 1993; Grimshaw et al. 2001; Shortell, Bennett,

and Byck 1998). In fact, studies of comprehensive geriatric assessment have shown that only 50 to 70 percent of treatment plan recommendations are translated into practice (Urdangarin 2000).

Given the difficulty of ensuring optimal quality care, many LTC providers have come to appreciate the research on chronic care management. This research shows that enhancing clinical effectiveness requires making the leap from relying solely on the judgments of individual professionals to instituting organizational policies and practices that systematically support evidence-based care by clinicians and ancillary personnel and that promote self-care by patients and their families (Wagner 1996). Anecdotal and qualitative evidence indicates that nursing facilities and home health agencies, under pressure to standardize care, are introducing practice guidelines that combine the synthesis of available science with expert consensus about best practices (Wunderlich and Kohler 2001). To manage some conditions, such as heart failure, cancer pain, urinary incontinence, pressure sores, and depression, LTC organizations have turned to guidelines that the former Agency for Health Care Policy and Research (AHCPR) developed for physicians. While the guidelines were not directed to LTC providers per se, parts of them are relevant to LTC populations. Providers also have turned to practice guidelines developed by the American Medical Directors Association and the American Geriatrics Society specifically for use in LTC settings (AGS 1997, 1998; AMDA 1996a, 1996b, 1996c, 1996d).

The virtue of these guidelines, developed through expert consensus, is that they are designed to make a user-friendly synthesis of scientific research available to busy providers who cannot be expected to review and systematically evaluate a broad scientific and clinical literature (see, e.g., Field and Lohr 1992; Institute of Medicine 1986, 1990). Even so, the clinical guidelines need to be updated frequently (Shekelle et al. 2001). Moreover, their availability does not guarantee widespread changes in practice. For example, according to MDS data collected before 1990 and after 1993, the urinary incontinence and pressure sore prevention guidelines for nursing homes were not associated with a lower incidence of urinary incontinence or pressure ulcers (Fries et al. 1997; Hawes, Mor, et al. 1997). In contrast, however, the use of restraints dropped dramatically once regulations were issued challenging their use (Kane et al. 1993).

Because LTC faces a major crisis in staffing, guidelines could facilitate the delegation of many tasks to paraprofessional personnel if there were

a systematic basis for guiding their performance. A number of studies examined the work environment of nursing facilities and the performance of nurses and nursing aides (Bowers and Becker 1992; Brannon, Streit, and Smyer 1992; Burgio et al. 1990; Cardona et al. 1997; Foner 1994; Sheridan, White, and Fairchild 1992). A few linked particular organizational practices, such as involving frontline workers in planning care, to a better quality of care (Bishop 1999; Kruzich, Clinton, and Kelber 1992; Sheridan, White, and Fairchild 1992). For the most part, however, staffing patterns and staffing constraints discourage the adoption of evidence-based practices in LTC. In regard to institutions, a large literature on the relationship between nursing home staffing and quality indicates that a minimal number of staff is necessary, though not sufficient, to enable an acceptable quality of care (Abt Associates Inc. 2001; Kramer and Fish 2001; Schnelle, Simmons, and Cretin 2001; Wunderlich and Kohler 2001). In regard to home health, the dispersion of both professional and paraprofessional workers contributes to a great variation in practice (Medicare Payment Advisory Commission 1998, 2001), which would benefit from evidence-based guidelines and protocols. But the difficulty of providing on-site support and supervision in a "dispersed" work setting creates barriers to implementing evidence-based care.

Measuring and Improving Quality. The quality of LTC, especially in nursing homes, depends heavily on external regulations, which focus principally on inadequate care. Most measurable standards of nursing home quality do not recognize excellence in care according to criteria based on positive outcomes, such as maximizing physical or psychological functioning or well-being (Wunderlich and Kohler 2001). Rather, the main indicators measure problems, such as the use of physical and chemical restraints, incontinence, pressure sores, malnutrition, or pain (Zimmerman et al. 1995). Likewise, in the area of home health, the first nationwide use of OASIS other than for prospective payment has been to derive negative measures of adverse events (e.g., the development of a urinary tract infection, an increase in pressure ulcers, or a substantial decline in three or more ADLs).⁴

To date, information on the quality of LTC provided in settings other than nursing homes is sparse (Wunderlich and Kohler 2001). In contrast, information on the quality of nursing home care is relatively extensive and systematic. Several research and investigative reports, as well as data from the federal survey and certification system and from studies using MDS-derived quality indicators, have recently examined the quality of

nursing homes. After reviewing this evidence in 2000, the Institute of Medicine's Committee on Improving the Quality of Long Term Care concluded that the quality of nursing homes had generally improved over the past decade, although significant and serious problems persist⁵ (Wunderlich and Kohler 2001).

More recently, the federal government has begun to rely on the publication of findings from analyses of quality indicators (QIs) derived from the MDS as a basis for consumer information.⁶ A good deal of research underlies the federal initiative, some on the development of the QIs and some on nursing homes' responses to quantitative performance measurements (Fitzgerald, Shiverick, and Zimmerman 1996; Ramsay, Sainfort, and Zimmerman 1995; Wagner, van der Wal, Groenewegen, and de Bakker 2001; Zimmerman et al. 1995). This strategy has several limitations. Questions have been raised about the quality of the underlying MDS data (Office of the Inspector General 1999), and experience in other areas with "report cards" suggests that consumers rarely use this information effectively (Chernew and Scanlon 1998; Hibbard et al. 1998; Lubalin and Harris-Kojetin 1999). The lessons learned from the Consumer Assessment of Health Plans Survey (Carman et al. 1999; McGee et al. 2002) have not been incorporated into the current reporting on nursing home quality. Useful quality information systems for consumers must be relevant to their situation, not general, and should actively engage the user rather than simply provide information.

Whether or not they expect individual consumers to choose their LTC provider based on published QIs, both nursing facilities and home health agencies—reacting in part to regulation, in part to the demands of third-party payers and a more competitive marketplace, and in part to real or anticipated media and advocacy attention to quality information—are increasingly concerned with demonstrating that their organizations provide high-quality care. Organizations that wish to be in the vanguard of quality are trying to identify management practices and organizational changes they can make to achieve and sustain measurable improvements in care. For the most part, however, research on how to motivate, sustain, or diffuse quality improvement in LTC settings is lacking. An important exception is the Commonwealth Fund–supported evaluation of the innovative Wellspring Program (Reinhard and Stone 2001; Stone et al. 2002), which concluded that collaborative efforts by institutions are a powerful mechanism for supporting effective, resource-intensive quality improvement and that a key determinant of success is the design

of models that commit nursing staff to work with and mentor frontline workers. Nonetheless, this innovative model has not yet spread widely enough to determine if it can improve quality generally.

Using Resources More Efficiently

Among managers' most vexing questions are those about the relationship between cost and quality. Every manager would like to be able to "do more with less" or at least to maintain quality at lower cost. Given limited resources, some managers seek information regarding the cost effectiveness of one type of care intervention compared with another and the relative payoffs of investments in human and technological resources. In addition, mindful of the volume/quality findings related to mortality from certain surgical procedures, some providers are asking about the volume of care that the organization or practitioner needs for optimal quality. The first two questions are related to "productive" efficiency: Can the current value of output be produced at a lower cost, or equivalently, could more output be provided at the current cost by shifting the input mix? The last question is related to "allocative efficiency," defined by economists as "the right amount" of a product being produced (Bishop 1999).

Unfortunately, research to answer these questions is spotty, and the findings are inconsistent (Binstock and Spector 1997). Most of the work has concentrated on nursing homes. Some studies suggest that better quality may not cost more, whereas others suggest that it does, because it depends on the number and mix of professional staff employed (Cohen and Spector 1996; Nyman 1998; Wiener and Stevenson 1998; Wunderlich and Kohler 2001). The findings from a CMS-supported study indicate that adequate nursing home care requires a minimum number of frontline staff but that the composition of the staff also is important (Abt Associates Inc. 2001). Moreover, it is not clear that large increases in staff will necessarily lead to proportionate gains in quality without other interventions.

Evaluating New Programs, Models, and Systems of Care

Program evaluation has helped assess the impact of LTC innovations, although its lessons have not always been heeded. Sometimes the innovation and the evaluation have been combined into a single demonstration

and research effort. At other times, evaluators have conducted research on innovative programs or models that sprang up independently. In some instances, models that received positive evaluations were not widely disseminated, whereas other innovative approaches were replicated despite equivocal or negative evaluations.

The history and precepts of evaluation projects have been well reviewed (Rossi and Freeman 1993). Evaluators are usually able to examine the effects of an innovation, but they may not always specify what changes are needed to improve the program. In addition to the many problems with developing appropriate measures and evaluating a project when it is sufficiently mature but its implementation can still be changed, evaluators must recognize that demonstration programs often have their own constituency to lobby for their preservation and criticize negative findings.

Several efforts to change organizational processes and improve patient outcomes revolve around the introduction and evaluation of geriatric nurse practitioners (GNPs) and academic nurses in nursing facilities. Evaluations of early training programs led investigators to conclude that GNPs can provide much of the primary care that nursing home residents need (Garrard et al. 1990; Kane et al. 1991; Kane et al. 1976; Reuben et al. 1999). Indeed, these demonstrations open the way to using GNPs in a variety of primary care settings to serve frail older persons. Although GNPs are still the exception rather than the rule in LTC settings, some programs have used them effectively. The Evercare program, for example, offers a Medicare + Choice capitation product targeted to nursing home residents and featuring extensive care by nurse practitioners (Kane et al. 2002). It has dramatically reduced nursing home residents' use of acute care hospitals (Kane et al. 2003).

The Teaching Nursing Home (TNH) Program tested the feasibility of improving nursing home care by establishing affiliations between schools of nursing and nursing facilities. The TNH sites instituted a variety of organizational changes, including the introduction of educational programs; problem-oriented interventions in areas such as falls, incontinence, and decubitus ulcers; and team-oriented patient care that included physicians and therapists but concentrated on nurse clinicians and nurses' aides. Compared with the control institutions, the TNH sites significantly decreased residents' hospitalization rates; reduced the incidence of catheterization, sedation, and restraints; and delayed functional decline (Shaughnessy et al. 1995).

Yet despite the model's demonstrated benefits, it has not been widely replicated.

In contrast, other innovative models and strategies have been adopted, even though their effectiveness or cost savings are not strongly supported. The LTC Channeling program is a case in point. Although the evaluation showed that investing in case management, even with additional resources to manage, produced few benefits (Carcagno and Kemper 1988; Kemper 1988), these findings did little to dampen the enthusiasm for case management because its advocates and policy/program staff perceived it as inherently logical and desirable. Even though the empirical evidence to support the effectiveness of case management is relatively weak⁷ (Bernabei et al. 1998; Gagnon et al. 1999), the legislation permitting more use of home- and community-based care under Medicaid waivers is conditioned on the presence of case management. Managed care programs view it as a way to cut costs (Pacala et al. 1995). One of the problems of using research to evaluate case management is the many meanings of the term *case management*. It can refer to determining eligibility for services and benefits, to controlling utilization, or to making sure that clients receive appropriate and adequate services.

Other examples of inherently logical and desirable concepts that have been widely disseminated despite equivocal evaluation results include the Program for All-Inclusive Care of the Elderly (PACE) and hospice. PACE is an intensive effort to use community services to avoid institutional care and has great appeal as an effective synthesis of care for dually eligible seniors. Although its evaluation did not show dramatic benefits and raised questions about its cost effectiveness (Branch, Coulam, and Zimmerman 1995; Chatterji et al. 1998), PACE was made an established part of the Medicare + Choice offerings. The National Hospice Demonstration concluded that hospice care did not produce many of the hoped-for benefits (such as better pain control, reduction in anxiety, and fewer bereavement difficulties) just about the time hospice care was formally included as part of Medicare (Greer et al. 1986; Mor 1987). A similar conclusion about hospice care was also reached in a randomized controlled trial (Kane et al. 1984). Hospice programs, however, as well as the more general concept of palliative care, have been embraced by the health care establishment for their promise of improved symptom control and end-of-life care. On a smaller scale, the largely negative evaluation of the Social Health Maintenance Organization (SHMO) demonstration (Manton et al. 1993; Newcomer et al. 1995) was effectively ignored

when the program entered a second generation. The results of this second wave are no more positive (Wooldridge et al. 2000), but the SHMO constituency continues to lobby for its continuation.

Recent efforts to create a better quality of life in LTC institutions illustrate how organizational innovations championed by leaders in the provider community to solve widely perceived performance gaps in the delivery system can take on national prominence in the absence of large-scale evaluation studies. Efforts to improve institutional quality of life have included both the redesign of institutions like nursing homes (e.g., creating subcommunities that offer residents more control of daily life and a better living environment, such as single rooms) and the development of new institutions, many of which fall under the general heading of assisted living. Although very detailed research demonstrates the benefits of even very modest increases in residents' control of their environment (Kane and Kane 1987), research assessing the benefits of these newer approaches has been sparse to date (Frytak et al. 2001; Hawes, Philips, and Rose 2000; Hawes, Rose, and Phillips 1999). Quality of life has been addressed by innovative approaches such as the Eden Alternative, which has great practitioner appeal because it offers practical, tangible suggestions for organizational redesign that addresses intangible but important issues. Although the one study that attempted to empirically evaluate the program found little effect (Coleman et al. 2002), the Eden Alternative model has been accepted nationally, albeit implemented in different ways.

Translating LTC Research into Practice: Supports and Barriers to Successful Implementation of Research Findings

Translating research into LTC practice is analogous in many ways to how technology and other innovations are adopted by organizations, industries, professions, and the like. The diffusion of innovation has three main elements: the characteristics of the innovation itself, the channels through which information about the innovation is communicated, and the social system in which adoption occurs (Rogers 1995). How LTC research is incorporated—or not incorporated—into organizational and individual practices is contingent on all these factors. In order for LTC organizations to adopt an evidence-based practice, several, often

parallel, decisions, actions, and processes—both individual and collective—must converge. At the least, scientifically valid findings must indicate what new models, interventions, and/or service modifications will be efficacious. Managers and practitioners must be able to understand the findings and appreciate their relevance to real-world problems. The components of the proposed changes must be well enough defined that they can be replicated, and potential users must receive whatever training and tools are necessary to maximize the likelihood of faithful replication. Information must be available to organizations to enable them to match the appropriate interventions to the relevant individuals or groups. Perhaps above all, *leadership* must emerge to advocate for change; *resources* must be available or redirected to support the change; and environmental, organizational, and personal *incentives* must be aligned to support and sustain desired gains (Institute of Medicine 2001).

Given the complexity of this process, it should be no surprise that the difficulty of translating research findings into sustainable improvements in care practices and clinical outcomes is well documented (Grimshaw and Russell 1993; Grimshaw et al. 2001; Grol 2001; Gross et al. 2001; Woolf et al. 1999). Some research findings are never incorporated into routine practice, and it may take a decade or more for others to be implemented (AHRQ 2001). Many programs and interventions lack a strong scientific base; others are perpetuated despite evidence of their ineffectiveness. The examples we have highlighted in this article show that LTC is no exception. In the following discussion we suggest how the clarity and timeliness of research-based tools and interventions, the resources required to implement them, and leadership and incentives can work for or against the use of LTC research to improve service delivery, sustain gains, and yield better client outcomes. A more exhaustive discussion of factors influencing the gap between LTC research and practice would require a separate article (see, e.g., Schnelle, Cruise, Rahman, et al. 1998).

Simplicity and Clarity

One key to the successful incorporation of research findings is the simplicity of the ideas and tools. The broad dissemination and enduring use of the Katz-derived ADL/IADL measures show how readily clearly articulated ideas that correspond to needs perceived by the

practice community can gain a receptive ear. Tools have the greatest impact on practice when they are discrete and scalable. Indeed, relevance may trump research sophistication. Nonetheless, a recurring problem in making research useful and usable to practitioners is complex and/or ambiguous findings, compounded by researchers' hesitation to go beyond narrowly reported findings to imply implications for practice.

"Real"-Time Information

Another key to successful research translation is the availability of the right kinds of information in time to make a difference. In an ideal world, client-specific information collected through assessment and prediction would be matched to evidence of the effectiveness (or cost effectiveness) of available actions and strategies for an overall plan of treatment for each client. Targeting criteria would be in place so that providers would not have to use resources to implement interventions for clients who would not benefit from them (Schnelle, Cruise, Rahman, et al. 1998). Clinical support systems would send appropriate guidelines to practitioners "at the right time and place," organize and present other information at critical times, and direct their attention to necessary tasks. Managers would have information about their clients, their care, and its outcomes. But these conditions are uncommon in the real world.

The task of designing, testing, and implementing sophisticated client-based clinical information systems is more technically demanding and resource intensive than most LTC organizations can manage. Thus the tools for turning data into information should be developed at the industry or system level rather than by individual organizations. A good example is the software specially designed to make the "triggers" and RAPs derived from the MDS available to nursing home staff. More recently, research-based efforts by CMS have made retrospective OASIS-based information on adverse patient events available on-line to home health agencies. Without broad-based research and development efforts, the clinical information systems available to LTC providers will continue to be relatively rudimentary, commercially developed or "home-grown" systems that do not incorporate up-to-date patient assessment data into the latest evidence-based practice protocols.

Resources

The examples discussed in this article suggest that studies of improving outcomes have more impact on expectations than on actual practice when they require more resources to support them. It is almost certainly not coincidental that the most successful changes in nursing home care have reduced the frequency of certain practices rather than introducing new ones (Schnelle, Cruise, Rahman, et al. 1998). Innovations that are inexpensive and easy to implement are favored over more complex and costly ones. New technologies that do not require major changes in practice behavior (e.g., exchanging one drug for another) are easier to sell than those that challenge long-held traditions, in part because changing behavior requires more resources. For example, many of the low-tech behavioral interventions, such as toileting-assistance programs shown to improve the continence of nursing home residents, are more time-consuming than the usual care, and their labor intensiveness limits their adoption (Wunderlich and Kohler 2001). Another limitation is the problem of “externalities.” In a highly fragmented payment and delivery system, even if a different LTC practice could be shown to reduce the total cost of care—for example, if a successful continence intervention reduced medication or hospital use by minimizing the sequelae of severe incontinence—the third-party payment system rather than the LTC provider would benefit (Schnelle, Cruise, Rahman, et al. 1998).

Resource constraints and externalities may also explain the resistance to using structured, comprehensive assessments to influence care plans and interventions. Perhaps more effort has gone into testing comprehensive geriatric evaluation and management interventions than almost any other aspect of practice. This evidence has created a greater appreciation of the need for comprehensive client assessment and the importance of thinking about the functioning of older persons in broad terms encompassing many domains. However, despite a number of positive studies, including many randomized clinical trials (Stuck et al. 1993), they are not often used.

Advocacy, Leadership, and Incentives

Making changes requires active and sustained advocacy. The literature on continuous quality improvement, for example, concludes that clinical quality improvements are likely to be more pervasive and last longer

when committed organizational leaders establish clear expectations and use internal strategies, systems, and incentives to support quality care (Shortell, Bennett, and Byck 1998). Most researchers do not hold senior leadership positions in the delivery system, nor do they generally see themselves as advocates. Conversely, most senior leaders in LTC do not see a role for research. The exigencies of delivering day-to-day service and ensuring a positive bottom line obscure the potential value of longer-term investments in research or other systematic knowledge-building activities.

Those running the programs being evaluated almost always see a strong role for advocacy and often create their own constituencies to press for continuing their program in advance of (or in opposition to) the evaluator's recommendations. The participants in the process may not see evaluations as learning experiences so much as threats to their programs' survival. Moreover, because no evaluation is without controversy, it is often tempting for a program's advocates to criticize unfavorable results and question the methods, measures, and timing.

Studies demonstrating the effectiveness of paradigmatic changes may reinforce a change when all the incentives are aligned to promote that change but may not reinforce the change when incentives are absent. For example, the persuasive evidence that a variety of strategies can improve the care of chronic diseases has not led to their widespread adoption (Boult, Kane, and Brown 2000). Part of the failure can be attributed to inertia. It is hard to change practices. But technologies and drugs have been quickly adopted, even when the evidence for their efficacy was equivocal.⁸

Practice innovations are more likely to be accepted when they are reinforced by regulations, payments, and the market (Shortell, Bennett, and Byck 1998), as well as cultural values (Rogers 1995). Drugs and devices make money for their developers, who are willing to invest in tactics such as the "drug detailing" needed to change practitioners' behavior (Soumerai and Avorn 1990). Advances in LTC, however, generally have no proprietary base and hence no active champions. Medical devices are usually associated with new payment opportunities, whereas few LTC advances enhance revenue. A more subtle factor may also be at play. Developments in medical research are associated with the belief that they offer the means to treat (or at least diagnose) a problem that can then be attacked more vigorously. In contrast, LTC tends to be viewed in passive terms. Because the trajectory for much of chronic care is decline, the

benefit from a LTC intervention may not be improvement but only a slowing in the rate of decline. Moreover, evidence of such benefit may not be readily detectable except in a formal research study in which a control group is shown to deteriorate more rapidly. Weak visibility and low expectations that investments in LTC can dramatically improve clients' outcomes make it difficult to mobilize leadership to support obtaining the necessary resources.

Conclusions and Recommendations

Research has affected the delivery of LTC in four ways: (1) by helping frame the goals of care, (2) by designing practical tools for documenting and describing LTC needs and outcomes, (3) by testing and assessing interventions and strategies for improving care, and (4) by evaluating new models, programs, and systems of service delivery. LTC has helped shape and refine practice agendas. Its most visible effects have come from work that has either defined a problem or altered expectations for the outcomes of care. Refinements in practice have resulted from assessing the impact of established services and testing new or modified interventions designed to produce better results. LTC research has also reinforced—and, in some cases, challenged—paradigmatic changes in care by evaluating the effectiveness and cost effectiveness of new programs and service models.

But as illustrated by the work highlighted in this article, most LTC practice research has focused on a relatively small number of problems, and most has been conducted in institutions. There is little research on the challenges of implementing, diffusing, and sustaining evidence-based practice within and across LTC settings. (Schnelle's work is a notable exception; see Schnelle, Cruise, Rahman, et al. 1998.) Given the multitude, diversity, and dynamics of LTC clients, conditions, problems, and settings, more—and more varied—research is needed on which to base practice. Rising costs will increase the demand for empirical evidence of the efficacy of alternative approaches and service variations. But the value of intervention research will be wasted if resources are not also spent on methodologically sophisticated investigation of the factors leading to the adoption and use of proven strategies in daily practice. Where feasible, guidelines and protocols should be created to help translate research-based interventions into practice, and efforts should be made

to ensure that the implementation remains true to the already proven design. In order to produce the necessary research, get it into the hands of decision makers in the delivery system, and maximize its chances for improving quality and outcomes, resources must be mobilized to support three sets of activities.

In line with our main conclusions, we recommend that (1) more investment be made in both basic and applied LTC research to address critical service delivery issues, (2) researchers and users communicate better to ensure the salience and credibility of LTC research, and (3) more resources be devoted to identifying and implementing successful methods and tools for translating research into practice.

Investing in Basic and Applied LTC Research

Support is needed for basic research on developing and improving methods to measure better the effects of and the needs for good LTC. Funding for health services research has been more vulnerable to the vagaries of the congressional budget process than funding for biomedical research, and funding for research on long-term care has had a particularly unstable past. Although researchers must address practice and implementation questions that are salient to practitioners, they should also pursue agendas not yet identified by the practice community. Indeed, many of the most important findings have come from investigators addressing more basic questions.

To build a balanced portfolio of LTC research that will improve quality and outcomes, research funding should support

1. Investigator-initiated development of theory, methods, and measures intended to advance society's general knowledge and understanding of LTC and its role in promoting positive function, health, and quality of life for those with chronic diseases and disabilities.
2. Organizational, systems, and behavioral research on the ways that the organizational culture, climate, and incentive systems; social and professional networks; and financing, payment, and regulatory mechanisms influence the adoption and implementation of innovations in LTC practice.
3. Effectiveness and cost-effectiveness studies of interventions, programs, and models designed to improve the quality, outcomes,

and efficiency of LTC for identified problems, conditions, and populations.

4. Management and implementation research on

- designing user-oriented protocols for the systematic implementation of techniques that have been proved successful, and the oversight of the implementation to ensure that it is faithful to the original intervention.
- analyzing the costs and resources (human and technical) required to implement protocols according to organizations' ability to support these costs.
- assessing the impact and costs of introducing and/or modifying information systems, decision support mechanisms, and other vehicles for communicating evidence-based information to managers and clinicians in understandable ways.
- studying the effectiveness and cost effectiveness of organizational strategies and mechanisms for implementing and sustaining practice changes over time.

5. The selection and training of promising young LTC researchers through dissertation and postdoctoral fellowships under the guidance of leading LTC researchers and experts to bring new people, ideas, and skills to the field, as well as to promote continuity.

Improving Communication among the Research, Practice, and Policy Communities

Researchers, practitioners, and policymakers speak different languages (Walshe and Rundall 2001) and often begin from different premises. The greater sophistication of research methods, especially analytic approaches, has created a paradox. The greater ability to model real-world patterns of chance events has made it more difficult to interpret and communicate the research findings. At a recent conference on ways to improve communication between LTC researchers and policymakers, a state decision maker observed that "researchers are from Mars, whereas policymakers are from Venus" (Feldman, Nadash, and Gursen 2001). The gap between LTC providers and researchers is even larger. Adopting empirical data is not a core value of the LTC practice community, and sensitivity to organizational maintenance and enhancement is not

a characteristic of most researchers. The former must learn to soar and the latter to ground themselves more firmly in reality if research is to become vital to LTC service delivery.

Most researchers believe that their job is done when the results are published. They do not appreciate the need to market their results. In fact, the academic research community may view such marketing as creating a loss of objectivity. Thus, resources should be mobilized to make research-based information available to LTC managers, practitioners, and policymakers in attractive and readily available venues and formats.

Improving communication, however, is not simply or primarily a matter of translating and brokering information about the results of research studies. Each group must be able to understand what the other has actually said. Researchers and users must be confident that the most important questions are being addressed and must be able to define what constitutes meaningful results. The evaluators and those being evaluated, as well as those who will have to act on the findings, should discuss and agree in advance on the criteria used to evaluate demonstration projects. The principal model for development in LTC has been innovation that is modestly evaluated. A concept that can meet a perceived need tends to appeal more to practitioners and politicians than does carefully conducted research.

To bridge the communication gaps among LTC researchers, LTC managers and practitioners, and LTC policymakers, funders should support

1. Periodic meetings, workshops, and conferences that bring together all the stakeholders necessary to make progress on selected topics.
2. Exchange programs and “scholar”- or “expert”-in-residence programs across research and service settings, providing opportunities for researchers to study the daily issues and challenges of practice and engaging practitioners as “content” experts to inform research studies.
3. LTC service-research “networks” consisting of researchers, practitioners and managers, and policymakers bringing a diversity of perspectives, expertise, and methods to bear on specific problems and issues identified as fruitful areas of study for improving the practice of long-term care.
4. Support for the synthesis and diffusion of practice-relevant research in formats and media readily accessible to targeted users.

Greater confidence in the relevance of research to the issues that most concern them should, in turn, encourage LTC delivery organizations to be more receptive to both the conduct and the application of practice and management studies. It should also encourage policymakers to accommodate changes with the promise of improving the quality and cost effectiveness of care.

Increasing Resources for Translating Research into Practice

The LTC delivery system itself needs resources to apply the research-based information. Such findings are often difficult to implement because the events, interventions, and outcomes they explain overlap. People who receive LTC almost always have health conditions, limitations, and disabilities that are interrelated and change over time. Thus, the medical and supportive interventions they require are not likely to be a single procedure or medication. Furthermore, how care is given may be as important as what care is given. Thus, LTC managers and practitioners must have the training and tools necessary to help them apply research findings appropriately. Because professional LTC staff are in short supply and most LTC is provided by relatively unskilled workers, building organizational capacity will be key to sustaining research-based improvements over time.

Efforts to translate research into LTC practice have been resisted not only because researchers and practitioners do not understand each other but also because providers have not been willing to support changes in practice (Schnelle, Cruise, Rahman, et al. 1998). In many instances the costs of implementing needed changes are more than public programs have been willing to pay. For example, the congressionally mandated report on nursing home staffing concluded that more staff would improve quality (Abt Associates Inc. 2001), but the administration chose not to adopt these findings because of their cost. Because LTC has a history of looking outward for its accountability, greater external pressures and inducements are needed to promote the adoption of research findings.

In order to build organizational capacity in the LTC delivery system and mobilize third-party payers and regulators to promote evidence-based practice, resources should be committed to developing, deploying, and testing

1. Innovative training and technical assistance methods that enable managers and practitioners to replicate proven care practices according to established protocols.
2. Novel payment and regulatory incentive systems that motivate and reward LTC organizations for using evidence-based practices to improve quality.
3. Delivery system centers to advance the quality of LTC (Wunderlich and Kohler 2001) by conducting research and demonstrations to redesign LTC processes, promote best practices, and improve the quality of life.

In sum, although more research is needed, more effort to promulgate the results of that research also is necessary. Given the ways that research has influenced LTC delivery in the past, we expect that more investment in the future will yield important new evidence about “what works for whom” and what needs to be done to implement it. But knowledge itself will not be enough if we do not also invest in workforce capacity and management systems that enhance the capacity of the workforce to make a difference in the lives of those for whom they care.

ENDNOTES

1. For additional definitions and discussion of basic versus applied research, see Choi and Grenberg 1982; Lawrence Livermore Laboratory 2002; NSF 1995.
2. The Centers for Medicare and Medicaid Services (CMS) contracted with the University of Minnesota to develop a system for assessing nursing home residents' quality of life. The research team identified ten domains that can be evaluated by interviewing residents. CMS also contracted with MedSTAT to develop measures for assessing the quality of life of individuals who receive home- and community-based services.
3. OASIS items include demographics, patient history, living arrangements, supportive assistance, sensory status, integumentary (skin) status, respiratory status, elimination status, neurological/emotional/behavioral status, activities of daily living, medical diagnoses and regimens, comorbidities and severity of symptoms, risk factors, prognosis, medications, and equipment management.
4. OASIS was originally developed to include both positive and negative quality indicators, and CMS is currently funding research and demonstration projects designed to support a nationwide Outcome-Based Quality Improvement System that incorporates both positive and negative measures of changes in patients' status over time.
5. Among the persistent and serious problems documented are improper care of pressure sores, insufficient attention to rehabilitative and restorative nursing, physical pain, lack of supervision to prevent accidents, and inadequate assistance with activities of daily living.

6. In the spring or summer of 2003, CMS will begin publishing OASIS-derived QIs for Medicare-certified home health agencies. Thus the strategy will be used for both the institutional and home health care sectors.
7. Some reports of case management in other countries are more positive. For example, Davies demonstrated the effectiveness of a more aggressive use of case managers in improving the care of older persons (Davies, Bebbington, and Charnley 1990; Davies, Fernandez, and Nomer 2000).
8. The drug approval processes for dementia and HIV stand out as good examples of instances of public pressure for a treatment-influenced scientific judgment.

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Acknowledgments: An earlier version of this article was presented at the Academy for Health Services Research and Health Policy invitational conference, Building the Field of Long Term Care, held on June 17, 2002, in Chantilly, Virginia. Support for writing this article was received from AARP, the Agency for Healthcare Research and Quality, the Retirement Research Foundation, and the Robert Wood Johnson Foundation. The views are those of the authors.

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