# Aging in Place: A New Model for Long-Term Care

***Karen Dorman Marek and Marilyn J. Rantz***

It is expected that at least 40 percent of the population over 75 will need extensive health care services late in their lives. The public has a negative view of nursing home placement that has, to some extent, been confirmed by research finding that the health of a frail older person deteriorates each time he or she is moved. The Aging in Place model of care for the elderly offers care coordination (case management) and health care services to older adults so they will not have to move from one level of care delivery to another as their health care needs increase. University Nurses Senior Care (UNSC) is the service entity of this project and provides as its core service care coordination with a variety of service options. These options include care packages or services at an hourly rate to meet individual client needs. The Aging in Place project will be evaluated by comparing project clients to residents of similar acuity in nursing homes and to similar clients receiving standard community support services. Data from this project will be important to consumers, researchers, providers, insurers, and policy makers. Key words: *community based care, elderly, long-term care*

DISSATISFACTION with the care of older adults is widespread in the United States among consumers, providers, family caregivers, and care providers. This dissatisfaction, along with the rising costs of long-term care, stimulated the University of Missouri Sinclair School of Nursing to plan for the development and implementation of a new model of care—a cost-effective alternative to nursing home care—that is responsive to elders' health care needs and consumer preferences. This public–private partnership venture is an innovative Aging in Place model for the elderly offering care coordination (case management) and health care services to older adults residing in specially designed senior apartments, other senior private or public congregate housing, or in their own homes in the community. With this new model, people will not have to move from one level of care delivery to another as their health care needs increase. Frail older adults will have the opportunity to"age in place." Aging in

The authors acknowledge the contributions of Older Adults Advisory Committee member, David Mehr, MD, and the Older Adults Executive Committee, Connie Brooks, MSN, RN, Victoria Grando, PhD, RN, Dean Emeritus Toni Sullivan, PhD, RN, FAAN, and Interim Dean Rose Porter, PhD, RN. Through the vision and efforts of the many committee members at the University of Missouri–Columbia, this service project is now reality.

The authors also acknowledge the support of the Health Care Financing Administration (HCFA). Research activities were supported partially by HCFA grant #C-5–35903. The opinions expressed in this article are those of the authors and do not represent those of the Health Care Financing Administration.

***Karen Dorman Marek, PhD, MBA, RN,*** *is Administrator of University Nurses Senior Care and Professor of Clinical Nursing, Sinclair School of Nursing, Columbia, Missouri.*

***Marilyn J. Rantz, PhD, RN, FAAN,*** *is Associate Professor, Sinclair School of Nursing, University Hospital Professor of Nursing, University of Missouri–Columbia, Columbia, Missouri.*

*Nurs Admin Q*, 2000, 24(3):1–11

P1: FPX/FSX P2: FHY
AS024-01 April 4, 2000 10:20 Char Count= 36642



Place is a much healthier approach as compared with our current long-term care delivery trajectory that forces a frail older person to move from one setting to another as needs change and results in mental and physical deterioration.[1–3] In this model, all services a person may eventually require are available as needed so there is no need to move to a different place.

## Background and Importance

In 1990, the U.S. Bureau of the Census ranked Missouri 12th in the United States, with 14 percent of the state's population aged 65 and over. By the year 2020, this age group is expected to account for 25 percent of Missouri's population. Even now, Missouri ranks 8th in the United States in the proportion of its population over age 85.[4] It is expected that at least 40 percent of the "old-old" population will need extensive health care services late in their lives. At the same time, consumer preferences for long-term care are changing. Above all the elderly desire to maintain independence and quality of life. The trajectory of services currently available often forces consumers toward unsatisfactory and costly institutional care such as nursing homes. Studies indicate that older adults have a negative view of nursing home services and strive to avoid such placements.[5–8] As a result, they can be isolated in their homes, unwilling to reach out for assistance until it is too late and their health has deteriorated. The public's negative view of nursing home placement is to some extent confirmed by research that the health of a frail older person deteriorates every time he or she is moved.[1–3] Research also emphasizes the fragmented disarray of older adult care and services. Changing demographics, the high cost of nursing home services, and the continuing shortcomings of current models create a compelling need for new approaches to long-term care for frail elders.[9,10]

The Aging in Place model allows older adults to age in the least restrictive environment of their choice. Key to Aging in Place is the separation of *type* of care with *place* of care. In this model, clients direct the timing and intensity of health and personal care services delivered to them in their home. The concept of home includes any residential setting in which formal medical services are not provided as part of the housing component. Home may mean a detached individual home, an apartment in a family member's home or a large complex, or a unit in a congregate housing arrangement with supportive services.[11] Clients are treated as tenants of their home rather than residents of an institution. However, the Aging in Place model is most successful when provided to individuals living in congregate or geographically close locations.[8]

For Aging in Place to be successful older adults must live in an environment supportive of independence, and care must be coordinated throughout the health care system. Care coordination provides a system to identify barriers, as well as to procure and coordinate services required by the frail older adult. Clients who receive care coordination receive a comprehensive assessment of their functional and cognitive capacities, strengths, abilities, limitations, existing resources, and supports. A plan is developed in partnership with the client based on the results of the assessment. Clients are monitored and services

P1: FPX/FSX P2: FHY
AS024-01 April 4, 2000 10:20 Char Count= 36642



are altered as the clients' health care needs change.

## Project Goal

The goal of the Aging in Place project at the University of Missouri–Columbia Sinclair School of Nursing is to allow frail older adults to remain in one setting as their health care needs intensify. University Nurses Senior Care (UNSC), a unique home health agency designed and licensed specifically for this project, provides care coordination and links frail older adults to ongoing health care services. Care is provided to older adults in senior private and public housing as well as individual homes. Congregate private and public housing are the first areas of implementation. In many of the area's retirement communities a large proportion of the residents are over 85 years of age and very frail. Without care coordination services most of these individuals would be forced to move out of the senior housing community into assisted living or nursing home environments. Problems such as incontinence, poor personal hygiene and nutrition, and medication mismanagement contribute to the older adult's loss of function and resulting move to another setting. The majority of these problems can be controlled or prevented with early intervention and monitoring. Each move to a different setting has major consequences for the health of the older adult by contributing to depression, confusion, and a loss of independence. Early detection, treatment, and monitoring can allow an individual to remain in the home of his or her choice and prevent many of the negative outcomes associated with relocation.

## Project Description

The focus of the Aging in Place project is the development, implementation, and evaluation of UNSC services for frail older adults living in senior congregate housing, public housing, and individual homes. UNSC is the first component to be implemented of a "housing with services" model being planned by the Sinclair School of Nursing. The larger project is a university- and community-based project, called Tiger Place, which will be located in Boone County in Columbia, Missouri, on approximately 6 acres. It is a public–private partnership venture designed to help older adults "age in place" in the least restrictive environment of their choice. Tiger Place will have Tiger Estates, a specially designed 100-unit apartment complex that will facilitate independence, freedom, privacy, and dignity. Tiger Estates is planned for completion by January 2001. However, UNSC began providing care coordination services to frail elderly in the Boone County area in March 1999. When Tiger Estates is completed, UNSC will provide care coordination and services to individuals living in Tiger Estates, in addition to other Boone County residents. Tiger Place also will have an academic center that will unite all the components of the project: research, practice, and education. Tiger Place is designed to be a national model of gerontological education, research, care delivery, and environmental design for the 21st century.

## University Nurses Senior Care

Negotiating the health care system to obtain needed health care services can be a

P1: FPX/FSX P2: FHY
AS024-01 April 4, 2000 10:20 Char Count= 36642



***Negotiating the health care system to obtain needed health care services can be a frustrating and stressful experience for older adults and their families.***

frustrating and stressful experience for older adults and their families. UNSC offers a model of care coordination and home care services to assist clients in obtaining the care they need while controlling costs by stopping unnecessary as well as duplicative services. Key to the UNSC is the tailoring of health care services to the client's health care needs. These services can range from health promotion activities such as exercise, diet, and nutrition programs to intensive personal care and skilled nursing services. A guiding principle of UNSC is to allow clients to age in the least restrictive environment of their choice.

Care coordination consists of several components. On admission, clients receive a comprehensive assessment of their functional and cognitive capacity, strengths, abilities, limitations, existing resources, and supports. A plan is developed in partnership with the client based on the results of the assessment. In this plan, services are bundled in packages designed specifically to meet the needs of the client. Clients are monitored and services are altered as clients' health care needs change. Reassessment is conducted as needed or at least every 3 to 6 months depending on the client's needs. The care coordinator is a master's-prepared nurse specially trained in case management. The care coordinator's role is to ensure that clients receive quality services that continually meet the client's needs. Included in the care coordinator's role are assessing and reassessing the client's needs, developing and implementing a plan of care, and monitoring the quality and efficiency of services delivered.

In addition to care coordination, UNSC offers in-home services provided by professional and nonprofessional staff to meet clients care needs. Services provided by UNSC include the following: (1) assistance with daily living activities, such as bath and tub assistance, dressing assistance, weekly cleaning and laundry, and outside errands such as shopping; (2) assistance with medications, such as medication setup, administration, or help with eye drops or inhalers; (3) social services, such as assistance with financial issues, bill payment, form completion, family issues, and counseling; (4) recreational activities, such as weekly exercise programs and bimonthly outings; (5) skilled nursing services, such as education and monitoring of medications, nutrition, disease, safety, and self-care; delivery of wound care and catheter care; and communication with family, physician, and other health providers; and (6) rehabilitation therapies, such as physical, occupational, and speech.

Another key component of UNSC services is the design and operation of wellness centers that are located in senior congregate living sites. The first wellness site began operation on March 1, 1999, at a senior housing site. The focus of the wellness centers is to prevent or detect early health problems that can compromise the frail older adult's health status as well as provide socialization and recreational activities for participants. Nurses are available by appointment and during scheduled walk-in hours. The wellness centers provide health services such as screenings and educational

P1: FPX/FSX P2: FHY
AS024-01 April 4, 2000 10:20 Char Count= 36642



programs, as well as individualized services such as incontinence management and nutritional counseling. Locating the wellness centers in senior housing communities facilitates the older adults' access to care. Often, older adults are more willing to seek assistance from the wellness center than they are to go outside the senior housing complex for health care.

**Reimbursement**

The challenge in providing community-based, long-term care services is finding a viable funding source for services. UNSC has employed several different options for payment of services. Private pay and Medicaid are the two most common sources of payment for long-term care services. UNSC offers a variety of payment plans for private pay clients. Care can be purchased in 15-minute increments or in monthly packages. For example, a common problem for the frail elderly is medication management. In the medication management package a registered nurse will fill a client's medication planner on a weekly basis, monitor a client's responses to medications, order medications from the pharmacy, and a home health aide will remind the client to take his or her medicines at prescribed times. Other packages developed are for personal care, bathing, and health care management.

Medicaid is the other common funding source of long-term care. UNSC is working with the Missouri Department of Social Services Division on Aging to provide home- and community-based services to individuals eligible for the Missouri Care Options (MCO) program. The focus of MCO is to inform individuals of available long-term care options; promote quality home- and community-based long-term care; moderate the growth of state-funded nursing facility placements; and enhance the integrity, independence, and safety of Missouri's older adults. Persons are considered eligible for MCO if the individual is considering state-funded long-term care, has low-level maintenance health care needs but is "medically eligible" for nursing facility care, could reasonably have care needs met outside a nursing facility, and receives Medicaid-funded long-term care in a home- or community-based setting. Individuals are screened and assigned a level of care (LOC) score that is used to authorize services in the state plan of care (service plan). Services include basic personal care, advanced personal care, registered nurse visits, homemaker care, and respite care. A specified number of monthly units are authorized, and the provider is reimbursed based retrospectively on the authorized units provided.

UNSC will provide services to MCO clients on a fee-for-service basis for 1 year to establish a database to develop a monthly capitated rate for MCO services using the Aging in Place model. Services that will be considered for inclusion in the capitated rate are adult day health, skilled nursing (including care coordination by registered nurses), restorative rehabilitation services (physical therapy, occupational therapy, and speech therapy), personal care/chore, transportation, social services by social worker, and medical supplies. The intent of this package is to provide the home and community services needed to allow frail elders eligible for MCO funding to age in place. These services are in addition to services provided through the Medicare Home Health Benefit.

P1: FPX/FSX P2: FHY
AS024-01 April 4, 2000 10:20 Char Count= 36642



If clients have conditions that meet the requirements of the Medicare Home Health Benefit, those services will be provided and billed to Medicare.

Services identified in the Aging in Place package are similar to a large portion of the services of the PACE (Program of All-Inclusive Care for the Elderly) model. In PACE, a fixed, monthly, per capita payment is issued to provide complete care to nursing-home-certified populations. The capitated rate is based on an average monthly Medicare premium, and a Medicaid portion based on the cost of the state's nursing home costs.[12,13] The Aging in Place package includes all the services offered in PACE with the exception of acute hospital care; specialized services such as optometry, audiology, dentistry, podiatry, and psychiatry; primary medical care and medical specialty services; laboratory and pharmacy services; durable medical equipment; and ambulance services. UNSC will be involved in coordinating some of these services when needed by clients, however, these services will not be managed or under contract with UNSC; therefore, no financial risk for these services will be undertaken by UNSC. However, it is expected that use of these services will decrease as a result of the care coordination and other services provided through the Aging in Place model.

Another Health Care Financing Administration (HCFA) demonstration project that tested a capitated rate for home care services is the Community Nursing Organization (CNO). The CNO tested two fundamental elements: nurse case management and capitated payment for the provision of community nursing and ambulatory services. Services included in the capitated payment were: parttime or intermittent nursing services; physical, occupational, and speech therapies; social and related services; part-time or intermittent services of a home health aide; medical supplies; durable medical equipment (DME); and ambulance services. Suggested optional services included in the legislation were homemaker services, personal care services, adult day health care, habilitation services, and respite care. However, the payment rate was based on age, gender, functional status, and previous Medicare home health care use. This payment rate did not take into account the services identified as optional. As a result, few of these services were offered, and the frail elderly were not the targeted population. The population recruited for the project was mostly the well elderly; less than 10 percent of the clients were frail enough to require long-term care home services.[14] The CNO did provide health promotion activities similar to some of the services that will be offered in the Aging in Place wellness centers. The Aging in Place model will serve a more frail population and will be able to identify the effectiveness of primary, secondary, and tertiary prevention on the frail elderly. The population served in the Aging in Place model is more similar to the population served by PACE. It is expected that many of the optional services identified in the CNO legislation will be offered in the Aging in Place model.

## Evaluation

The purpose of the Aging in Place model is to prevent nursing home admission for those individuals who could have their long-term care needs met in a community setting.

P1: FPX/FSX P2: FHY
AS024-01 April 4, 2000 10:20 Char Count= 36642



***The purpose of the Aging in Place model is to prevent nursing home admission for those individuals who could have their long-term care needs met in a community setting.***

Therefore, the individuals in the Aging in Place project will be compared to clients of similar case-mix (acuity) in nursing homes as well as to clients in the community receiving MCO services but not enrolled in the Aging in Place project. To demonstrate the effectiveness of the Aging in Place model both the quality of care and the cost of care must be examined. If the cost of care is decreased but the level of quality in care delivered is less, then the Aging in Place model is not a viable alternative for long-term care delivery. Also, if the level of quality increases and the cost of care is significantly higher in the Aging in Place model, then the model may not be an affordable option for long-term care for policy makers to consider. We believe the cost of overall health care will be less and the quality of care will be at a higher level in Aging in Place clients.

**Quality measures**

In the Omnibus Reconciliation Act of 1987 (OBRA 87) Congress mandated the development of the Minimum Data Set (MDS) for resident assessment and care planning, routine use of the MDS for all nursing home residents, and use of a quality assurance and assessment process in all nursing homes to improve the quality of care.[15] Much research has been devoted to developing and testing quality indicators (QIs) derived from MDS data by the Center for Health Systems Research and Analysis (CHSRA).[16–19]

The University of Missouri (UM) MDS research team has conducted extensive research on the MDS QIs and Missouri nursing homes.[20–23] We use the same methods developed by CHSRA staff in the calculation of QIs from MDS data.[24] It is possible to measure quality of care based on MDS information for a specific resident, a specific nursing home, and nursing homes in aggregate with QIs that are outcome and process measures of quality of care.[16,17,20,25–27] Using the standard MDS instrument, it is possible to analyze 24 of the 30 QIs (see Table 1). The UM MDS research team has extensive experience analyzing QIs, and we will compare QIs of the clients in the Aging in Place project with those of residents with similar characteristics and acuity living in nursing homes. We expect better quality outcomes for the Aging in Place clients.

**Resource utilization groups**

Since this is a pilot demonstration project, the comparison group is not randomly selected. In order to identify a comparison group, resource utilization groups (RUGs) will be used to identify patients of similar characteristics to the Aging in Place clients so that comparison of similar groups can occur. RUGs for nursing home residents are similar to diagnosis-related groups (DRGs) in hospital patients. RUGs are based on assessment items of the MDS and time studies conducted by HCFA in a sampling of skilled nursing facilities.[28] Relative resource utilization is reflected in a case-mix index (CMI) value assigned to each RUG classification cell. An index value of 1.0 represents

P1: FPX/FSX P2: FHY
AS024-01 April 4, 2000 10:20 Char Count= 36642



**Table 1.** Quality indicators derived from MDS data

| | Quality indicators |
|---|---|
| 1 | Prevalence of any injury |
| 2 | Prevalence of falls |
| 3 | Prevalence of behavioral symptoms affecting others |
| 4 | Prevalence of diagnosis or symptoms of depression |
| 5 | Prevalence of depression with no treatment |
| 6 | Use of nine or more medications |
| 7 | Incidence of cognitive impairment |
| 8 | Prevalence of bladder or bowel incontinence |
| 9 | Prevalence of occasional or frequent bladder or bowel incontinence without a toileting plan |
| 10 | Prevalence of indwelling catheters |
| 11 | Prevalence of fecal impaction |
| 12 | Prevalence of urinary tract infections |
| 13 | Prevalence of antibiotic/anti-infective use* |
| 14 | Prevalence of weight loss |
| 15 | Prevalence of tube feeding |
| 16 | Prevalence of dehydration |
| 17 | Prevalence of bedfast residents |
| 18 | Incidence of decline in late loss ADLs |
| 19 | Incidence of decline in ROM |
| 20 | Lack of training/skill practice or ROM for mobility-dependent residents* |
| 21 | Prevalence of anti-psychotic use, in the absence of psychotic and related conditions |
| 22 | Prevalence of anti-psychotic daily dose in excess of surveyor guidelines* |
| 23 | Prevalence of anti-anxiety/hypnotic use |
| 24 | Prevalence of hypnotic use more than two times in last week |
| 25 | Prevalence of use of any long-acting benzodiazepine* |
| 26 | Prevalence of daily physical restraints |
| 27 | Prevalence of little or no activity |
| 28 | Lack of corrective action for sensory or communication problems* |
| 29 | Prevalence of stage 1–4 pressure ulcers |
| 30 | Insulin-dependent diabetes with no foot care* |

*Cannot be calculated due to the standard version of MDS in use.
MDS, Minimum Data Set; ADLs, activities of daily living; ROM, range of motion.
*Source*: Data from the Center for Health Systems Research and Analysis, University of Wisconsin–Madison (2000). Quality Indicator Definition Matrix–MDS 2.0 without Section T and U. Madison, WI: Author [online Available: www.chsra.wisc.edu/CHSRA/QIs/QIs.htm.

average daily use. A value of 1.2 indicates resource use 20 percent greater than average. CMI values can range from as low as 0.4 to as high as 3.7. Table 2 contains the major RUG-II groups. For evaluation purposes, clients in the Aging in Place project will be matched with clients in nursing homes on admission by RUG score.

### Cost of care

To adequately examine the cost of the Aging in Place project, the total health care costs

P1: FPX/FSX P2: FHY
AS024-01 April 4, 2000 10:20 Char Count= 36642



**Table 2.** Resource utilization groups (RUGs)

| Category |
|---|
| Special rehabilitation |
| Ultra high |
| Very high |
| High |
| Medium |
| Low |
| Extensive services |
| Special care |
| Clinically complex |
| Impaired cognition |
| Behavior |
| Reduced physical function |

expended for health care will be examined. It is predicted that the costs related to hospitalization, emergency department visits, and physician visits will decrease in the Aging in Place group as compared with the nursing home group and as compared with the other MCO group. Both Medicare and Medicaid claims databases will be examined for health care expenditures. In addition, actual costs of the Aging in Place program will be included in the analysis.

## Data Collection

All clients participating in the Aging in Place project will be assessed by registered nurses using a specially designed comprehensive assessment that is similar to the nursing home MDS, the MDS-HC.[29] Assessments will be completed on a bimonthly basis, when readmitted after hospitalization, and at times of significant changes in condition. We added several nursing home MDS items to the assessment to be able to calculate comparative QIs with nursing home residents. The MDS-HC and additional MDS items will be collected at the point of care using the CareFacts computerized clinical documentation system. The CareFacts system (CareFacts Information Systems, St. Paul, Minnesota) is a point-of-care documentation system that provides a comprehensive relational database related to home health care practice.

Since UNSC is a home health care agency it also is required to collect OASIS (Outcome Assessment Information Set) data. In addition, the Omaha System is used to guide clinical data collection and provide a standardized framework for nursing diagnoses, interventions, and outcomes.[30] The OASIS data set is included in the assessment and discharge documentation with mapping to the Omaha System, MDS-HC, and additional MDS items when necessary to prevent duplication of data entry.

The clinical data collected at the point of care during the process of care delivery are data related to cost and quality monitoring. Home care providers view documentation as a burdensome and sometimes meaningless exercise, especially if data elements collected are not supportive of the practitioner's need for information to provide care. Computerized information systems that support practice by designing data entry and access to complement the provider's information needs also provide an excellent source of data for the evaluation of care. The CareFacts system was designed to complement the provider's need for information so that data are documented once during the process of care delivery rather than after care delivery. Because of the ease of data entry, multiple problems and interventions can be identified at each patient encounter. It would be

P1: FPX/FSX P2: FHY
AS024-01 April 4, 2000 10:20 Char Count= 36642



difficult to obtain such information from handwritten paper records. The data available from such a documentation system will provide a useful database to study health care practice in the Aging in Place model and link those data to the cost and quality analyses.

## Conclusion

We believe the Aging in Place model is a viable alternative to nursing home care for many frail elders. In this demonstration project we will develop, implement, and evaluate this model. Evaluation will include examination of both the cost and quality of care delivered in the Aging in Place model compared to similar clients in nursing home care and similar clients receiving standard community support services. The results of this project will provide pilot data on the effect of the model on the quality of life of frail elders and determine whether this model is a cost-effective alternative to nursing home care. The findings of this project will provide guidance to consumers, researchers, providers, insurers, and policy makers.

## REFERENCES

1. Johnson, R.A. 1999. Helping older adults adjust to relocation: Nursing interventions and issues. In *Transitions in the older adult*, eds. L. Swanson and T. Tripp-Riemer. New York: Springer, 52–72.
2. Manion, P.S., and Rantz, M.J. 1995. Relocation stress syndrome: A comprehensive plan for long-term care admissions. *Geriatric Nursing 16*, no. 3: 108–112.
3. Rantz, M.J., and Egan, K. 1987. Reducing death from translocation syndrome. *American Journal of Nursing 87*, no. 10: 1351–1352.
4. U.S. Census Bureau, U.S. Department of Commerce. 1993. *We the American elderly.* Washington, DC: U.S. Census Bureau.
5. Collins, C.E. et al. 1997. Models for community-based long-term care for the elderly in a changing health system. *Nursing Outlook 45*, no. 2: 59–63.
6. Johnson, R.A. et al. 1997. Residential preferences and elder care: Views of Hispanic elders. *Journal of Cross Culture Gerontology 12*, no. 1: 91–107.
7. Johnson, R.A. et al. 1994. Factors influencing nursing home placement decisions. *Clinical Nursing Research 3*, no. 3: 269–281.
8. Kane, R. 1995. Expanding the home care concept: Blurring distinctions among home care, institutional care, and other long-term care services. *Milbank Quarterly 73*: 161–186.
9. Buhler-Wilkerson, K. 1991. Home care the American way: An historical analysis. *Home Health Care Services Quarterly 12*, no. 3: 5–17.
10. Kane, R.A. et al. 1998. *The heart of long-term care.* New York: Oxford University Press.
11. Benjamin, A.E. 1992. In-home health and supportive services. In *In-home care for older people: Health and supportive services*, eds. M.G. Ory and A.P. Druncker. Newbury Park, CA: Sage.
12. National PACE Association. 1996. *A PACE profile: 1996.* San Francisco, CA: Author.
13. Shen, J., and Iveson, A. 1992. PACE: A capitated model towards long-term care. *Henry Ford Hospital Medical Journal 40*: 41–44.
14. Schmitz, R. et al. 1996. *Evaluation of the community nursing organization demonstration interim evaluation report.* Cambridge, MA: Abt Associates, Inc.
15. McElroy, D., and Herbelin, K. 1989. Assuring quality of care in long-term facilities. *Journal of Gerontological Nursing 15*, no. 7: 8–10.
16. Karon, S.L., and Zimmerman, D.R. 1996. Using indicators to structure quality improvement initiatives in long-term care. *Quality Management in Health Care 4*, no. 3: 54–66.
17. Karon, S.L., and Zimmerman, D.R. 1997. *Results of quality indicator validation studies.*

P1: FPX/FSX P2: FHY
AS024-01 April 4, 2000 10:20 Char Count= 36642



Final report to the Health Care Financing Administration. Washington, DC: Government Printing Office.
18. Zimmerman, D.R. 1998. Quality indicator validation studies. Paper presented at the AHFSA conference, St. Louis, MO, October 27.
19. Zimmerman, D.R. et al. 1995. Development and testing of nursing home quality indicators. *Health Care Financing Review 16*, no. 4: 107–127.
20. Rantz, M.J. et al. 1996. Assessing quality of nursing home care: The foundation for improving resident outcomes. *Journal of Nursing Care Quality 10*, no. 4: 1–9.
21. Rantz, M.J. et al. 1997. Setting thresholds for MDS quality indicators for nursing home quality improvement reports. *Joint Commission Journal on Quality Improvement 23*, no. 11: 602–611.
22. Rantz, M.J. et al. 1997. Verifying nursing home care quality using minimum data set quality indicators and other quality measures. *Journal of Nursing Care Quality 12*, no. 2: 54–62.
23. Rantz, M.J. et al. In press. Update on setting thresholds for MDS quality indicators for nursing home quality improvement reports. *Joint Commission Journal on Quality Improvement.*
24. Center for Health Systems Research and Analysis. 1996. *Quality indicators for implementation.* Version 6.1-MDS 2.0 Quarterly. Madison, WI: University of Wisconsin–Madison.
25. Rantz, M.J. et al. 1998. *Outcome-based quality improvement for long-term care: Using MDS, process, and outcome measures.* Gaithersburg, MD: Aspen Publishers.
26. Ryther, B.J. et al. 1994. Using resident assessment data in quality monitoring. In *Quality assurance in long-term care*, eds. T.V. Miller and M.J. Rantz, 126–128. Gaithersburg, MD: Aspen Publishers.
27. Ryther, B.J. et al. 1995. Update on using resident assessment data in quality monitoring. In *Quality assurance in long-term care*, eds. T.V. Miller and M.J. Rantz, 126–128. Gaithersburg, MD: Aspen Publishers.
28. Fries, B.E. et al. 1994. Refining a case-mix measure of nursing homes: Resource utilization groups (RUG-III). *Medicare Care 32*: 668–685.
29. Morris, J.N. et al. 1997. Comprehensive clinical assessment in community setting: Applicability of the MDS-HC. *Journal of the American Geriatrics Society 45*: 1017–1024.
30. Martin, K.S., and Scheet, N.J. 1992. *The Omaha system: Applications for community health nursing.* Philadelphia: W.B. Saunders Co.