Nursing home resident assessment and case-mix classification: Cross-national perspectives

Two broadly applied systems in the United States, the National Resident Assessment Instrument/Minimum Data Set and the Resource Utilization Groups, have provided new insight into the quality, delivery, and financing of nursing home care. In this article, the authors describe research efforts in eight other nations to translate, validate, and use one or both systems to understand their own long-term care systems. This consortium of studies, using common instruments, provides potential cross-national analyses that capitalize on differences in practice patterns and system designs to address critical policy issues.

Introduction

As major reforms in hospital prospective payment were successfully implemented in the U.S. Medicare program in the mid-1980s, attention turned to reform for other providers that were still being paid by Medicare on a retrospective cost basis. Nursing home payment reform presented an especially challenging area, given the significant differences in the structure and regulation of nursing homes in States across the country. In addition, policy development was complicated by controversies over the quality of care provided nursing home residents in the United States. Still further complicating this situation was the lack of common data and classification systems to describe and measure nursing home performance in terms of the characteristics of residents cared for in facilities, their relative use of staff and other resources, and their clinical and functional outcomes.

Since 1981, the Health Care Financing Administration (HCFA) has sponsored a number of initiatives to examine policy reform in the nursing home industry. Two of these initiatives—the Resident Assessment Instrument (RAI) Minimum Data Set (MDS) and the Resource Utilization Groups (RUGs)—are at the core of programmatic and experimental efforts to reform nursing home policy in the United States. For the first time, these systems provide a national and unified methodology to describe and classify nursing homes according to resident case mix and resource use, which enables prospective pricing methodologies to be linked to a case-mix classification system. These initiatives also help establish systems for monitoring the quality of nursing home care based on periodic resident assessment data, claims data, and onsite surveillance visits that reflect national and State norms for acceptable treatment and resident outcomes.

Even though national applications of the RAI and RUGs are in the early stages of implementation and have not yet been extensively evaluated (as have, for example, diagnosis-related groups [DRGs] for hospital care) substantial interest has been expressed by international organizations in the application of these technologies to other countries. A major focus of this work is to determine whether the concepts, development methods, and structures of the RAI and RUGs are transferrable to other health care systems and cultures, especially given the diverse role nursing homes play in long-term care service delivery in different countries. In this article, we describe current initiatives in the United States, Europe, Asia, and Australia, to validate the RAI and RUGs and to explore the potential for these systems to aid in cross-national comparative policy research.

In the next section, we briefly describe the RAI and RUGs and their development and use in the United States. The applications of these technologies in Europe, Asia, and Australia are reviewed. The resulting data and validations are then used in an example to contrast characteristics of the institutionalized elderly in four disparate nations: Sweden, Italy, Japan, and the United States. We conclude with suggestions for areas of considerable promise for further cross-national policy research.

U.S. assessment and case-mix systems

In the past decade, there has been considerable effort in the United States to develop better methods of understanding the types of residents in nursing homes. These efforts were initially aimed at improving our understanding of the cost differences between nursing homes. It quickly became clear that facilities varied in the range and distribution of types of residents for whom they cared and that a method for relating resident characteristics to resource use was central to understanding underlying differences in the cost structures of nursing homes. Moreover, with the successful implementation of the prospective payment system (PPS) for acute care hospitals in the mid-1980s, the development of case-mix classification systems for all types of institutional providers became of immediate interest for the design of government payment systems. Systems that recognize varying care needs of patients will, all other things equal, promote more equitable provision of resources appropriate to patient needs (Fries and Cooney, 1985).
Developing a resident assessment instrument

In response to discovered problems and legal challenges about the quality of care in U.S. nursing homes, a report was issued by the Institute of Medicine of the National Academy of Sciences that identified resident assessment as a key component to improving this quality (Institute of Medicine, 1986). Later, the U.S. Congress in the Omnibus Budget Reconciliation Act of 1987 (Public Law 100-203) mandated a nationwide system of nursing home resident assessment. As described in section 4201 of that law, the purpose of this assessment was to develop appropriate care plans for nursing home residents. Since 1988, a consortium of research organizations (Research Triangle Institute in North Carolina, Hebrew Rehabilitation Center for the Aged in Boston, Brown University, and University of Michigan), under contract with HCFA, has developed and tested and is currently evaluating the implementation of a uniform resident assessment system—the national RAI system. The RAI is designed to guide individualized resident care planning with two interrelated components. The first component, the MDS, contains the core items necessary for a comprehensive assessment of nursing facility residents. The RAI also provides triggers (individual items or combinations of MDS elements) to identify residents for whom specific resident assessment protocols (RAPs, which are the second part of the system) will be considered. RAPs have been developed for each of 18 major problem areas associated with nursing home residents, such as delirium, falls, communication, psychosocial well-being, and cognitive loss. Each RAP provides guidelines for the development of care plans, including suggestions for additional information needed and a state-of-the-art summary of options for care planning and service provision. By law, full assessments are performed upon admission, at least annually thereafter, and upon significant change in the resident’s status. Instruments, instructions, and training materials have all been developed and widely distributed by public and private sources (Morris et al., 1991).

The core of the RAI is the MDS, a broad assessment instrument with more than 300 individual items that not only describes the nursing needs of residents but also incorporates measures of residents’ strengths and psychosocial needs. The development of the MDS included extensive testing, dozens of major drafts, and broad input from hundreds of clinicians, administrators, regulators, industry representatives, and consumer advocates. Considerable attention was placed on the specification of timeframes, exclusions or delimiters (e.g., score how a resident eats, regardless of skill), and examples. Multistate testing of an early version of the MDS showed acceptable reliability (Morris et al., 1990). More recently, the final instrument has demonstrated substantially improved reliability (Hawes et al., to be published). (The final instrument and the MDS quarterly review are provided in Figure 4 at the end of this article.)

Current work focuses on the creation of summary scales representing major dimensions of resident status (e.g., cognitive impairment [Morris et al., to be published] mood state, behavior problems, and physical functioning) and indicators of quality of care. These scales are being measured on both cross-sectional and longitudinal data and will consider both process and outcome measures of quality of care. These data are increasingly being applied as well to policy analysis, such as the cost of physical restraints (Hawes, Phillips, and Fries, to be published).

The RAI has been mandated for use in all U.S. nursing homes that qualify for Federal payments—virtually all of the approximately 16,000 nursing homes nationwide—will be a complex process that will take many years to complete. In the meantime, several States and a major HCFA-sponsored demonstration project on nursing home case-mix payment (described later) have already begun to centralize data collection at the State level, which will result in large-scale, representative data bases being available in the near future.

Developing case-mix systems

Over the past two decades, there have been many systems developed to measure case mix (specifically, the characteristics of residents related to their resource use) in nursing homes (Fries and Cooney, 1985; Cameron, 1985; Arling et al., 1987; Weissert et al., 1983; Winn, 1975; Fries et al., 1989; Morris et al., 1987). Case-mix measurement in health care facilities was first used in hospitals (most notably, DRGs) (Fetter et al., 1991). When applied to nursing homes, however, several changes to case-mix measurement were necessary. First, although DRGs explain the cost of an entire hospital
stay, usually via the proxy of length of stay, in nursing homes the variability of length of stay (and thereby episode cost) is too great to be practical for payment system design. Thus, nursing home case-mix systems generally focus on explaining daily resource use. Technically, measuring actual per diem resource use at the level of the individual resident adds significantly to the complexity of these systems. Such a per diem system manifests other nursing home differences. As with any health care system, residents' clinical and functional status changes over time. With a per diem system used for payment determination, residents need to be reassessed to keep payments accurate and fair; there are intrinsic opportunities to manipulate resident characteristics appropriately (e.g., responding to policy incentives) or inappropriately (e.g., "gaming").

A second major difference is that, unlike acute hospital care, for which the patient's clinical diagnosis is the major determinant of resource use, residents' functional status and major physical conditions are at the core of explaining resource use in nursing homes. A number of studies have emphasized the importance of functional abilities in explaining the cost of care and have shown little or no link between the clinical diagnosis and the resources used in caring for nursing home residents. Virtually all studies have found that Katz' index based on activities of daily living (ADLs, including ability to dress, bathe, eat, toilet, transfer, and walk) are critical determinants of the time and cost of caring for nursing home residents (Katz et al., 1963; Swarington, 1978; Fries and Cooney, 1985).

A series of efforts, funded by HCFA, have developed case-mix resident classification systems for nursing homes (RUGs), which have achieved substantial application in the United States. The goal of RUGs is to group nursing home residents by resident characteristics so as to explain resource use. The RUG-II classification system was developed specifically for use in the Medicaid case-mix payment system for New York State nursing homes, where it has been in operation since January 1986 (Schneider et al., 1988). In addition to its application there, paying close to $3.25 billion annually, the RUG-II system has also been used for resource allocation among the Department of Veterans Affairs Medical Centers, and a derivation is incorporated into the approximately $1 billion Medicaid nursing home payment system in the State of Texas.

As part of a major HCFA multistate demonstration of nursing home case-mix payment and quality, a new version of RUGs—RUG-III—has just been completed (Fries et al., to be published). Derived in a similar manner, RUG-III improves upon the mid-1980s RUG-II version by identifying better measurements for cognitive impairment, additional ADLs, and "high-tech" residents, such as those who must be fed parenterally or who are on ventilators. RUG-III also updates the RUGs to reflect current clinical practice. A major advantage is that RUG-III is based primarily on data elements available in the MDS. A few items need to be added, principally to document services provided (such as nursing rehabilitation); these items were excluded from the MDS because they were considered to be not critical to the planning of care.

RUG-III was derived from a specially collected data base of 7,658 residents in 203 nursing homes in seven States. All facilities in the stratified sample were screened to meet acceptable federally defined quality of care standards; a case-mix system based on resident care patterns in substandard facilities would be of little use. Data of two types were involved: measures of resource use and of resident characteristics. Resource use was collected by self-reporting of staff (nurses, aides, therapists, social workers, etc.) of the total time they spent over a 24-hour period caring for each resident, including time directly provided in care, or indirectly provided through interactions with other staff, physicians, family, and others that benefited the resident. We have developed and validated a variety of techniques to ensure accurate measurement data. Over the past 8 years, these techniques have been replicated with considerable success in seven studies with large samples of patients. In nursing homes, the cost of staff represents almost all of the costs that vary by residents. Other costs associated with operating the nursing home are either fixed over all residents (e.g., capital costs, facility maintenance), highly related to staff time (e.g., pharmacy costs), or relatively small (e.g., minor supplies). Thus, we developed wage-weighted staff times as our resource measure to be used as a dependent variable. These weights acknowledged the differences in cost of care provided by a registered nurse or a nurse aide, for example. The classification system structures, however, are reasonably insensitive to changes in these weights.

The second type of data provided the independent variables to define the classification groups. Resident characteristics were assessed using an early version of the MDS. Thus, we had information on resident demographics, medical conditions, diagnoses, mental functioning, ADLs, behavior problems, and services provided. The RUG-III development addressed three major types of criteria: statistical, clinical, and administrative. The statistical criteria included measures of the cost homogeneity of the groups as well as how well the system explained resource use. Based on a study of the total cost of resident care in the combined 7-State sample, the RUG-III system of 44 groups explained 55.5 percent of the variation among individual residents in 24-hour resource cost, with groups that were relatively homogeneous (i.e., with low coefficients of variation). (For comparison purposes, the DRG system, with 10 times as many groups, when applied to all patients in acute care hospitals, has a variance reduction of 26-40 percent, depending on which components of cost are included; however, we cautioned against the direct comparison of these numbers because, as described earlier, the RUG system measures nursing home per diem resource costs and the DRG system measures hospital episode costs.) When facility or unit identifiers were added as covariates to the model, the RUG-III variance explanations increased to 68 percent and 71 percent, respectively. The clinical criteria assured that the RUG groupings made sense to
ADL variable | Score
--- | ---
Bed mobility, toilet use, and transfer: Independent or supervision | 1
Limited assistance | 3
Extensive assistance or total dependence: Other than 2-person physical assist | 4
2 or more persons physical assist | 5
Eating: Independent or supervision | 1
Limited assistance | 2
Extensive assistance or total dependence | 3

NOTES: RUG-III is Resource Utilization Groups, Version III. Scores are summed for four ADL variables. Index ranges from 4 to 18. The individual variables are subject to time and other delimiters, as specified in the Minimum Data Set, which should be used to define the individual resident characteristics listed here.

SOURCE: (University of Michigan and Rensselaer Polytechnic Institute, 1992).

Table 1

RUG-III activities of daily living (ADL) Index

The development and adoption by the U.S. Government of the RAI and MDS as the national system for resident assessment and care planning in nursing homes has been an important factor in focusing international interest on developing uniform data systems for measuring the clinical and functional characteristics of nursing home residents. The parallel development of RUGs has provided a tool for other countries to measure case mix and to facilitate understanding of the similarities and differences in nursing homes residents and services within nations.
Figure 1
Resource Utilization Groups, Version III (RUG-III) classification system

NOTES: ADL is the RUG-III activities of daily living index. Table 1 describes the RUG-III ADL index. Figure 2 describes the major categories. Other variables are described in Figure 3.

SOURCE: (University of Michigan and Rensselaer Polytechnic Institute, 1992.)
### Resource Utilization Groups, Version III (RUG-III) hierarchy categories

**Special rehabilitation**—Rehabilitation therapy is any combination of physical, occupational, or speech therapy. Residents meeting the criteria for any of the four subcategories listed below are classified into this major category.

- **Very high intensity multidisciplinary rehabilitation**: 450 minutes or more of rehabilitation therapy, at least 5 days per week of one type of therapy, and at least two of the three therapies provided.
- **High intensity rehabilitation**: 300 minutes or more of rehabilitation therapy per week, and at least 5 days per week of one type of therapy.
- **Medium intensity rehabilitation**: 150 minutes or more of rehabilitation therapy per week, and at least 5 days per week of rehabilitation therapy.
- **Low intensity rehabilitation**: 45 minutes or more of rehabilitation therapy per week, at least 3 days per week of rehabilitation therapy, and at least two types of nursing rehabilitation occurring at least 5 days per week.

**Extensive services**—Residents who have a RUG-III ADL index score of at least 7 and who meet at least one of the following criteria:
- Parenteral feeding.
- Suctioning.
- Tracheostomy.
- Ventilator/respirator.

**Special care**—Residents who have a RUG-III ADL index score of at least 7 and who meet at least one of the following criteria:
- Burns.
- Coma.
- Fever, with vomiting, weight loss, pneumonia, or dehydration.
- Multiple sclerosis.
- Pressure ulcers of stage 3 or 4.
- Quadriplegia.
- Septicemia.
- Intravenous medications.
- Radiation treatment.
- Tube feeding.

**Clinically complex**—Residents who meet at least one of the following criteria:
- Aphasia.
- Aspiration.
- Cerebral palsy.
- Dehydration.
- Hemiplegia.
- Internal bleeding.
- Pneumonia.
- Stasis ulcer.
- Terminal illness.
- Urinary tract infection.
- Chemotherapy.
- Dialysis.
- Four or more physician visits per month.
- Respiratory or oxygen therapy.
- Transfusion.
- Wound care other than pressure ulcer care, including active foot care dressings.
- Or: residents who meet the criteria for the extensive services or special care categories but who have a RUG-III ADL index score of 4 to 6.

**Impaired cognition**—Residents with a RUG-III ADL index score of 4 to 10 who have cognitive impairment in all three of the following dimensions:
- Decisionmaking (not independent).
- Orientation (any problem recalling current season, location of own room, staff names or faces, or that he/she is in a nursing home).
- Short-term memory.

**Behavior problems**—Only residents with a RUG-III ADL index score of 4 to 10 are classified in this category. Residents who display daily problems with:
- Inappropriate behavior.
- Physical abuse.
- Verbal abuse.
- Wandering.
- Or with:
- Hallucinations.

**Reduced physical functions**—Residents who do not meet the conditions of any of the earlier categories, including those who would meet the criteria for the impaired cognition or behavior problems categories but have a RUG-III ADL index of more than 10.

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The individual variables are subject to time and other delimiters, as specified in the Minimum Data Set which should be used to define the individual resident characteristics listed here.

**SOURCE:** (University of Michigan and Rensselaer Polytechnic Institute, 1992).

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The international interest in technologies to understand long-term care in advanced industrialized nations has been initiated by government officials, by international organizations such as the World Health Organization, and by academic researchers. The expression of interest by policymakers is not surprising. The most notable social and economic trends of the past century—increases in national wealth, rising real incomes, increasing personal consumption, and substantial investments in health and social welfare programs—have led directly to the growth of the population age 65 and over in advanced industrialized nations. A secondary demographic trend, less well recognized and reported, is the rapid growth in the number of individuals age 80 and over in these societies. Projections indicate that, between 1990 and 2030, the absolute numbers of individuals age 80 and over will increase by up to 50 percent in Germany, Belgium, Denmark, Norway, the United Kingdom, and Sweden; between 50 and 100 percent in Italy and the...
Figure 3
Other variables used in Resource Utilization Groups, Version III (RUG-III)

Extensive treatment count—A count of extensive treatments is used to identify RUG-III groups in the extensive services category. This count is the number of the following criteria:
- Parenteral feeding.
- Tracheostomy.
- Suctioning.
- Ventilator/respirator.

Depressed mood (sad)—Signs and symptoms of a depressed or sad mood are used as a tertiary split for the clinically complex category. Residents with a depressed or sad mood are identified by the presence of a combination of symptoms, as follows:
- Persistent sad or anxious mood and at least two other symptoms of the following list of five:
  - Expressions of distress.
  - Agitation or withdrawal.
  - Early awakening with unpleasant mood or awake 7 hours or less a day.
  - Thoughts of death or suicidal thoughts.
  - Weight loss.
- Alternately, a resident is identified as depressed if a diagnosis of depression or bipolar disease and at least one from the above list of five symptoms is present.

Nursing rehabilitation—Nursing rehabilitation activities are used as a tertiary split for the impaired cognition, behavior problems, and reduced physical functions categories. When used in the special rehabilitation category, "toileting program" is omitted as a qualifying activity. A count of two or more of the following activities occurring at least 5 days a week places an individual in the higher resource use category or group:
- Amputation care.
- Active range of motion.
- Splint/brace assistance.
- Training in:
  - Dressing/grooming.
  - Eating/swallowing.
  - Locomotion/mobility.
  - Transfer.
- Any toileting program (not used for defining low intensity rehabilitation category).

The range in rates of institutionalization suggests that significant variations in the use and costs of institutional services by the frail elderly should be amenable to policy intervention. However, most international studies of these issues are single-nation studies or descriptive comparative case studies. Serious national and international examination of these issues has been limited for a variety of reasons, but a widely acknowledged impediment has been the lack of consensus on the definition of a long-term care institution. For example, in the United States alone, more than 50 designations have been used by States in licensing facilities commonly identified as providing long-term care, including: swing-bed hospitals; nursing homes; skilled nursing, intermediate care, extended care, or subacute care facilities; personal care homes; adult foster care facilities, and rehabilitation hospitals (National Center for Health Services Research, 1985). Other countries exhibit similar variation in the types of institutions providing long-term care, which complicates these comparisons.

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Netherlands; 200 percent in Japan and the United States; and more than 200 percent in Australia and Canada. In several countries, notably Australia, Canada, and Japan, much of this growth will occur over the next 20 years (Organization for Economic Cooperation and Development, 1988).

Population increases on this scale present significant new policy challenges for these countries in maintaining the funding base for health and social services, given the rapid increases in disability and the equally rapid increases in the use of health and personal care services after age 75, and particularly after age 80 (Organization for Economic Cooperation and Development, 1988). Much of the policy concern in meeting the continuing care requirements of the frail elderly has centered on the provision of institutional long-term care in hospitals, nursing homes, and other residential care settings. Institutional care is often the most expensive form of long-term care, and its role relative to in-home and community-based services is not well understood in addressing financing issues for long-term care.

Several analysts have attempted to measure the extent to which the frail elderly in different countries receive long-term care in institutional settings and to document expenditure differences as a result of this variation. Of interest in these studies of relatively industrialized countries is not only the absolute rate of institutionalization (ranging from 5.5 percent in the United States to nearly 11 percent in the Netherlands), but also the variation in institutional rates by area within countries. This latter variation is apparently as great, if not greater, than that between these countries. Institutional expenditure differences, to the extent documentable, also vary widely. Few, if any, of these variations can be attributed to age structure alone (Doty, 1988). As we discuss later, there is also considerable variation in the types of institutions providing long-term care, which complicates these comparisons.

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Although the name of a type of institution, e.g., "nursing home," has been demonstrated not to be equivalent across or even within nations, we believe that comparisons are valid when performed at the level of the individual resident (Fries et al., 1991). For example, if we find nursing homes in one country to be twice as expensive as in another country, we are not necessarily better informed. Does the disparity in costs reflect a significant difference in resource inputs, or practice patterns, or is it a byproduct of differing health care systems that place different types of patients in nursing homes? However, if between these two countries there is a difference in costs for a particular type of resident, then we have the basis for defining and contrasting nursing homes based on a variety of policy dimensions (including cost differences) by comparing their resident populations and resource inputs.

Specific national initiatives

These observations have generated multinational interest in the use of common technologies to describe long-term care. There are currently researchers in at least eight countries (in addition to the United States) experimenting with the RAI or RUGs. For example, the MDS has already been translated into French, Swedish, Danish, Italian, German, and (in part) Japanese. The Italian and French translations have included the entire RAI, with RAPs. We discuss here the current status of the eight cooperating national projects: in Denmark, Sweden, Italy, Japan, England and Wales, Netherlands, Australia, and Switzerland. Other nations in which coordinating projects are being considered include France, Spain, Germany, Mexico, Scotland, Norway, Austria, and New Zealand.

Denmark

A study being pursued by clinical researchers at the Kommunehospitalet in Copenhagen will use a Danish translation of the MDS to assess all residents in the 58 nursing homes and 3 geriatric hospitals of Copenhagen for an 8-month period beginning October 1, 1992. In total, an estimated 5,300 assessments will be performed by nurses trained by the project staff. This effort is directed by clinicians and long-term care providers in the Copenhagen area as an attempt to improve care planning and clinical practice in long-term care settings. After 1 year of data collection and use of the MDS, the effectiveness of the system will be evaluated and, if successful, the MDS will continue to be used as the common assessment system for long-term care residents in all nursing homes and geriatric hospitals in the Copenhagen area.

1 Project leaders in the several collaborating nations include: Drs. Roberto Bernabei (Rome, Italy), G. Iain Carpenter (Winchester, Great Britain), Jean-Nicolas DaPasquie (Geneva, Switzerland), Dinaus Frijters and Cora van der Kooij (Utrecht, Netherlands), Naoki Ikegami (Tokyo, Japan), Gunnar Ljunggren (Stockholm, Sweden), Marianne Schroll (Copenhagen, Denmark), and Malgosia Zlobicki (Brisbane, Australia).

Sweden

In contrast, the government of Sweden has supported research on RUGs in Swedish nursing homes and geriatric hospitals since 1987. Researchers at the Karolinska Institute in Stockholm have performed a number of studies, primarily validating and using the RUGs (Ljunggren, Fries, and Winblad, 1992), as we describe briefly in the following section. Currently, researchers are collecting full MDS assessments or the subset of items necessary for RUG-III classification on an estimated 1,000 residents in nursing homes and geriatric hospitals in and around Stockholm. The purpose of this latest data collection is to pilot the use of the MDS, assess its use for facility payment and management, and demonstrate its potential to differentiate nursing home populations and predict lengths of stay. During the past year, control of nursing homes has passed from the county councils to the municipalities, some of which are exploring the use of RUGs to assist them with their new regulatory and financing role for institutional long-term care.

Italy

A group of physicians in the Geriatric Department of the Università Cattolica del Sacro Cuore of Rome have translated the entire RAI, both MDS and RAPs. They are using it as the core of a 4-month training program for registered nurses who will work in nursing homes. To date, the program has involved 2 cohorts of 20 nurses each. Italy is just beginning a rapid expansion of nursing home beds to assist in the movement of the frail elderly out of hospitals and into lower levels of care. As a result, there is strong interest in several Italian regions (the jurisdictional level that either directly manages or finances nursing home care) to implement the RUG-III system. It is the hope that RUG-III will make it possible to understand the types of residents cared for, determine financing levels, and encourage the use of the RAI for care planning. The full RAI system will be implemented in eight nursing homes in the Emilia-Romagna and Liguria regions, with a total of almost 500 residents. This experiment will prepare for the introduction of the RAI and RUG-III in all nursing homes in these two regions.

Japan

A research group at the Keio University in Tokyo has undertaken a study to validate the RUG-III system for use in Japan. The study, supported largely through private foundation funds, has assessed patients using an instrument developed by translating those MDS items necessary for RUG-III classification. The study also collected detailed measures of facility staff time, using protocols similar to those developed in the United States. Preliminary results, based on a sample of 871 residents in 8 Tokyo nursing homes or geriatric hospital units, demonstrate that the RUG-III system is effective in explaining resource use and that variations in resource use among RUG-III groups were relatively similar to those in the United States, although
somewhat compressed. A larger sample of residents, assessed using portions of the MDS, is planned for the fall of 1992. The study will also apply the MDS to elderly living in the community; both the institutional and non-institutional samples will be tracked for 18 months.

**England and Wales**

Concerns over poor standards of care for nursing homes and excessively long hospitals stays among the frail elderly have heightened governmental interest in long-term care policy (Royal College of Physicians, 1992). As part of this interest, the Resource Management Board of the Department of Health in Britain is currently sponsoring a major validation of the RUG-III system, led by a physician at St. Paul’s Hospital in Winchester. By October 1993, full assessments and staff time measurements (again, using protocols similar to those in the United States) will be completed for 2,300 residents in 29 hospitals located in 8 health districts throughout England and Wales. A major goal of this study is to understand the applicability of the RUG-III system to post-acute care patients and determine when in a patient’s stay such classification is appropriate. The RUG-III system could be used in the British National Health Service to establish and standardize level-of-care guidelines for all post-acute resource use for the elderly. A small study to test the acceptability of the MDS for nurses is also being planned.

**Netherlands**

Researchers in the Netherlands have been very active in examining the applicability of RUG-II to nursing home residents in their country. In June of 1990, the SIG Informatiecentrum voor de Gezondheidszorg sponsored a major international conference on nursing home case-mix reimbursement, which highlighted U.S. efforts to develop the RUG-III system and issues regarding its application in other countries. A study of residents in Dutch nursing homes determined that the RUG-II system was effective in differentiating residents by resource use, but worked better for somatic nursing homes that specialize in rehabilitation, convalescence, or terminal care than for psychogeriatric facilities that specialize in the treatment of mental disorders, such as senile dementia (Frijters and Kooij, to be published). This research helped confirm our more complete treatment of dementia residents in the RUG-III classification system. Plans are under consideration for a 1993 test of the MDS and RUG-III in a pilot group of nursing homes.

**Other nations**

Both Australia and Switzerland are preparing for potential studies using the RAI. One hospital in Australia has been experimenting with its use and researchers at the Queensland University of Technology are planning a larger study in the Brisbane area. In Switzerland, 15 facilities, including regular and psychogeriatric nursing homes as well as psychogeriatric hospital wards in 7 cantons, have already volunteered to conduct a 12-month test of the full RAI. The test will examine the applicability of the RAI to Swiss long-term care institutions and the cost-effectiveness of the MDS as a care planning and quality assurance tool. The test will begin in early 1993 and will involve the use of control units of residents in each facility. The project is sponsored by the 7 cantonal public health authorities.

**Common themes**

Several common themes are seen in these international studies. First, although the RAI and MDS are still in the early stages of testing, these instruments appear to have achieved common acceptance in clinical settings throughout Europe as well as in countries on the Pacific Rim. This has led to the use of the MDS for care planning or staff training, often employing the RAPs. Preliminary tests have shown the MDS to be relatively reliable. Thus, its assessment capabilities make it a potentially strong basis for communication, a common lexicon for nursing home residents that spans languages and cultures. With fully compatible versions in many of the major languages, there is significant potential to use the MDS as the basis for cross-national research.

Second, care needs to be taken in the translation of the MDS/RAI into other languages. In every case, the translation has been performed by a bilingual professional (and, in all but one case, a physician) particularly knowledgeable about nursing homes. Also, (except for the Italian and German versions, which are under way) we have performed a back-translation to English of every item, example, delimiter, and timeframe, with careful evaluation of differences between the two English versions. Even with this care, complications have arisen. For example, whether the resident was able to dress himself or herself was back-translated from Japanese as the ability to dress in western-style clothes. Clearly this latter is a substantially different concept, involving familiarity and ability to deal with buttons, snaps, and zippers, compared with the different complexities of Oriental dress. Moreover, most Japanese nursing home residents never wear western-style clothes. After considerable discussion, the Japanese translation was adjusted to represent the residents’ ability to dress in any clothes because we determined that this ADL should reflect the resident’s mental and physical capability to dress himself or herself, irrespective of clothing styles.

Third, RUG-II and RUG-III, as a summarization of assessment items to predict resources, appear to be effective in different countries despite differences in the long-term care systems. In the Swedish and Japanese validation studies previously described, RUG-II and RUG-III achieved 40-60 percent variance explanation of directly measured resource cost. Moreover, despite considerable differences in staffing and practice
patterns, the relative resource use (case-mix indexes) of groups follow a pattern similar to that in the United States.

Finally, the impetus for developing these applications of the RAI and RUGs has been relatively similar to that in the United States, with some adjustment to the particularities of the host nation. The RAI is considered for its potential to support individual residents' care planning and quality assurance, and both systems are of interest for their potential characterization of the institutional population for policy development. The RUGs are of interest initially to provide a concise summary of the types of residents seen, and eventually to establish nursing home admission policies, criteria for level-of-care determinations, and even resource allocation. For example, RUG-II was used last year to distribute additional year-end funds to Dutch nursing homes to spend on nursing staff.

An example of potential applications

In this section, we provide a single example of the type of information that can be derived from resident-specific data from multiple nations, drawing on data made available by selected projects described in the previous section. The presentation of this example is principally to demonstrate the feasibility of the analysis; extrapolation to national comparisons at this time is premature because of the preliminary nature of at least two of the samples currently available.

Earlier we suggested that the term “nursing home” was not useful in cross-national comparisons. In fact, in many nations, it may be a misnomer or may not apply to any institutional settings. Although virtually all chronic, long-term institutional care of the elderly in the United States is provided in nursing homes, this is not universally true elsewhere. In Britain, for example, the provision of long-term care is split between geriatric hospitals operated and funded by the British National Health Service and nursing homes that are largely privately owned and financed (Royal College of Physicians, 1992). Japan has three types of long-term care facilities, differentiated by the level of care provided, yet has an average hospital length of stay (excluding psychiatric beds) well in excess of 1 month. Italy is entering a period of major expansion of nursing homes, to replace the care provided in hospital settings.

Over the last few years, three national studies have developed data compatible with that in the United States to permit us to develop RUG-II case-mix classifications of representative or at least preliminary samples of institutional health care settings for the elderly. In two cases (Sweden and Japan), these data were developed as part of projects to validate the RUG systems; for Italy, they are an indirect product of preliminary application of the MDS.

The Swedish study was performed in 1987 and included 1,134 residents in long-term care facilities of Stockholm County. This represented the total population of six long-term care institutions assessed once: 1 hospital department of geriatrics (146 patients); 3 nursing homes (2 with 100 residents and 1 with 150 residents); and 2 mixed institutions (250 and 380 residents) consisting of a combination of geriatric and nursing home wards. In total, the sample represented 13 percent of all Stockholm long-term care beds in 1987. In Sweden, each long-term care organization (sometimes divided into nursing homes and geriatric departments) had a defined area-based elderly population for which it was solely responsible, and the residents it cared for represented all long-term care institutional use of this population. Therefore, the results obtained might be generalizable to all of Sweden. We have earlier reported these data in contrast with the New York State data, described in Fries et al. (1991).

The Japanese data were derived from a sample of 871 residents in 8 long-term care facilities in the Tokyo area. The sample includes 4 geriatric hospitals, 3 facilities equivalent to U.S. nursing homes, and 1 specialized rehabilitation hospital. Together, this is one of the largest and most comprehensive data sets collected on Japanese institutionalized elderly. This project, currently in its final phases, is validating the newer RUG-III system, using methods virtually identical to both the Swedish and original U.S. studies. Preliminary results indicate that the RUG-III system works quite well; we have utilized these data here to develop RUG-II classifications compatible with those from the other nations.

The Italian data are the least representative, describing a total of 316 residents from 2 “typical” nursing homes in Italy, 1 urban and 1 rural. The urban nursing home is a 220-bed facility in Rome, and the rural nursing home has 96 beds and is located in the Abruzzo region. These classifications were directly computed from application of the Italian translation of the MDS.

These three countries' data are contrasted here with those describing the entire population of New York State nursing home residents, assessed for payment determination and quality assurance. These data are for 94,840 residents in a cross-section of the population, collected in a wave of assessments from July to December 1988. Although we have seen differences across States in RUG-II and RUG-III distributions, these differences have been primarily in the percentage of residents in the rehabilitation categories. Otherwise, we believe the New York data are representative of U.S. nursing homes.

For each sample, the residents were classified into the 16 categories of RUG-II. The RUG-II system was used rather than the newer RUG-III because the data currently available in two of the nations were insufficient to support the latter. Although the design of RUG-III is similar to that of RUG-II, the latter has only two dimensions. A hierarchy of five groups describes the resident in terms similar to those of RUG-III, then each group is split according to a RUG-II ADL index based on three ADLs: toileting, eating, and transfer. Within each major category (e.g., heavy rehabilitation), from two to five groups are formed, with increasing levels of dependency (e.g., RA residents are more functionally independent than RB...
residents). (The RUG-II system is described in Figure 5 at the end of this article, and additional details are available in Schneider et al., 1988.)

The comparison of the RUG-II distributions in these four nations' nursing homes is given in Table 2. It represents the prevalence of each of the major categories as well as of the individual RUG-II groups. Thus, 66.3 percent of all New York State (U.S.) residents are in the reduced physical functions category, with 32 percent (21.0/66.3) of these residents in the highest functioning PA group. Similar prevalences for other countries are provided in other columns. An additional row provides for each country an estimated overall case-mix index, using the relative resource cost derived in New York State to weight the percentages of residents in each RUG-II group. The average case-mix of the derivation sample in 1986 was arbitrarily set to 1.00; by 1988 in New York State, it had risen to 1.04.

When examined at the level of the major hierarchy categories, three of the nations (except Japan) have approximately equal percentages in the lower two categories—about 70 to 75 percent—although the balance between behavior problems and others (reduced physical functions) is similar only between the United States and Italy. The distributions for the first three (more resource-intense) categories vary across the four nations. Although the distribution across all five categories is similar for the United States and Italy, the distributions within categories are considerably different, representing significantly contrasting levels of ADL functioning. These differences are also seen in the case-mix indexes, which range from 0.79 for Italy to almost 40 percent more (1.10) for Sweden and Japan.

Extreme caution needs to be taken in interpreting the results seen in this table, for the samples may not each be representative of an entire nation. The primary finding is that there are significant differences in the samples, despite the fact that each represents institutionalized elderly. However, it is also encouraging to examine the differences in light of national policy. We have previously suggested that the higher percentage of behavior problems in the Swedish sample may be the result of policy that moved dementia residents out of hospitals and into nursing homes. Similarly, the lower U.S. prevalence of rehabilitation patients, especially those with better ADL functioning, may in part be the result of the short-term, intensive rehabilitation benefit available under Medicare; such patients in rehabilitation hospitals and rehabilitation units of acute care hospitals are not included in this sample. The lower case-mix index for Italy appears consistent with the policy of Italian nursing homes to admit less disabled elderly, while the most disabled remain in hospitals.

**Discussion and conclusions**

There is a growing awareness among the industrialized nations of shared common problems and

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**Table 2**

| Resident-II distribution, by country and resident category: United States, Sweden, Japan, and Italy |
|---------------------------------------------------------------|
| **Resident category** | **United States** | **Sweden** | **Japan** | **Italy** |
|-----------------------|-----------------|----------|---------|---------|
| Total                 | 100.0           | 100.0    | 100.0   | 100.0   |
| Heavy rehabilitation: |                 |          |         |         |
| RA                    | 4.3             | 9.1      | 7.3     | 12.7    |
| RB                    | 0.7             | 5.7      | 3.4     | 6.6     |
| SC                    | 3.6             | 3.4      | 3.9     | 6.0     |
| Special care:         |                 |          |         |         |
| SA                    | 5.3             | 4.2      | 15.6    | 0.3     |
| SB                    | 1.2             | 1.0      | 3.8     | 0.3     |
| BC                    | 4.1             | 3.3      | 11.9    | 0.0     |
| Clinically complex:   |                 |          |         |         |
| CA                    | 18.7            | 10.0     | 28.3    | 13.9    |
| CB                    | 2.7             | 2.3      | 6.4     | 7.3     |
| CC                    | 8.3             | 3.8      | 14.2    | 4.7     |
| CD                    | 6.3             | 3.6      | 5.7     | 1.9     |
| Behavior problems:    |                 |          |         |         |
| BA                    | 1.4             | 0.4      | 0.0     | 0.0     |
| BB                    | 5.4             | 32.0     | 16.2    | 7.6     |
| BC                    | 1.1             | 4.8      | 5.5     | 6.3     |
| Reduced physical functions: |         |          |         |         |
| PA                    | 21.0            | 6.6      | 17.0    | 59.5    |
| PB                    | 3.4             | 3.6      | 4.5     | 4.1     |
| PC                    | 29.3            | 23.0     | 12.2    | 1.9     |
| PD                    | 9.8             | 10.4     | 0.9     | 0.0     |
| PE                    | 2.9             | 1.1      | 0.0     | 0.0     |
| Case-mix index        | 1.04            | 1.10     | 1.09    | 0.79    |
| Number of residents   | 94,840          | 1,134    | 871     | 316     |

**NOTES:** RUG-II is Resource Utilization Groups, Version II. Within each category, letter designations (RA, RB, SA, SB, etc.) reflect decreasing levels of activities of daily living function.

**SOURCES:** Fries, B., University of Michigan, 1991; Ieegami, N., Keio University, 1992; and Bernabei, R., Universita Cattolica del Sacro Cuove, 1992.
common objectives in providing long-term care to a rapidly growing frail elderly population (Organization for Economic Cooperation and Development, 1988). Until recently, technologies amenable to quantitative policy research to address these problems were unavailable. The application and validation efforts currently under way in Europe, Asia, and Australia strongly suggest that nursing home populations are indeed very different and that the RAI, MDS, and RUG systems hold considerable promise as a common language for clinicians, researchers, and policymakers to compare resident populations, care patterns, staffing, and resource requirements. Clearly, across languages and cultures, there must be considerable care taken to ensure appropriate translation of the intrinsic concepts, but once accomplished, the development of comparable data sets is feasible.

The current developments described in this review provide a network of data collection and analysis efforts, replicating in other nations samples of nursing home resident assessments that can be contrasted with each other and the large data sets we are assembling in the United States. In the future, countries may be able to assemble smaller, larger, or even population-based samples. Within each country, resident assessment would provide researchers with insights, including descriptions of resident characteristics, care process, quality, and outcomes, into their own long-term care systems. As an example, Australian researchers might better understand the different types of residents that are receiving non-acute care in hospitals or are located in nursing homes or "hostels." If longitudinal followup is feasible, it would be possible to look at care outcomes.

Given this, the larger scope of comparative work is feasible. With consistent RAI items, definitions, and training, we have an unparalleled opportunity to contrast these populations, to understand variations in care patterns and evaluate their effect on outcomes, and to examine "naturally occurring experiments" provided by differing long-term care systems.

Initial applications appear most promising in the area of exploring differences in clinical practice patterns. An example is the evaluation of the causes of a decreased incidence of falls in Japanese nursing homes compared with those in the United States; Lipsitz and colleagues have recently shown this phenomenon to be related to differential use of antidepressant medication (Lipsitz et al., 1991). With identification of appropriate control groups, we can contrast longitudinal outcomes resulting from physical or chemical restraints, all without additional data collection, intervention, or training. This in turn can lead to the design of more definitive intervention studies in the United States or elsewhere. The RAI tools currently being developed in the United States, including RUGs, summary clinical scales, and quality measures (both cross-sectional and longitudinal) will serve well to contrast populations. A major result may be identifying the effects of alternative clinical practices, such as the use of rehabilitation or placement policies, upon resident outcomes. These outcomes can be not only mortality but more sensitive measures such as a decline or improvement in physical functioning. We are currently examining the breadth of different hypotheses that can be addressed by samples that are either developed by convenience sampling or are representative of a population, that have different scopes of longitudinal followup, and that can result from additional information describing the staffing, organization, structure, or costs of the institution.

Further, the availability of resident assessment and case-mix data will permit economic analysis of the effectiveness and efficiency of alternative financing, regulatory, and system designs. Clearly, countries need to discriminate carefully in what is borrowed or adapted from elsewhere. For example, considerable research is required to assess the utility of the RUG-III methodology in countries that rely heavily on hospitals with a mix of acute and chronic patients in the same settings. Studies in England, Australia, and Germany are beginning to test RUG-III in acute care hospitals. One likely result of an analysis such as that exemplified in Table 2 is that post-acute care institutions in other nations compare well with skilled nursing facilities in the United States, thus changing our unit of analysis to a more flexible one that incorporates post-acute geriatric care in both hospitals and nursing homes.

It is premature to forecast the possible impact that resident assessment and classification systems may have on future reforms of the long-term care systems in industrialized nations. The efforts described in this review are fairly independent and have largely been limited to validating the RUG-III system or evaluating clinical practice. Indeed, the policy effects of the RAI and RUG-III systems on long-term care financing and service delivery reform in the United States are still evolving and will be intensively evaluated over the next several years. Nevertheless, whether the long-term care system is financed on a fee-for-service basis or through global budgets, there is a common international objective to provide a more equitable system of resource allocation that rewards greater efficiency and effectiveness in caring for the elderly. Accurate and standardized assessments, linked directly to care planning, can help identify and address medical, mental, and functional problems. Case-mix systems that effectively differentiate residents according to the resources they require (and consume) are essential elements to achieving such objectives.

Technology transfer also has considerable potential to benefit U.S. long-term care programs. Research efforts abroad that document clinical practice patterns and organizational arrangements that lead to superior resident outcomes will clearly benefit the quality of care for nursing home residents in the United States. Application of the RUG-III system for resource allocation in global budgeted systems such as the Netherlands might also be useful for long-term care financing reform in the United States. Finally, experimentation with broader application and modification of the RAI and RUG systems for long-
term care services provided in the home or alternative housing could facilitate system-level analysis of the impact of policy proposals on the full continuum of care for the frail elderly. Northern European countries may be particularly suited to lead this development effort because of their relatively well-developed infrastructure for providing long-term care in the community.

Acknowledgments

The authors gratefully acknowledge the gracious assistance of the leaders and project staffs of the several national studies discussed here; this is as much their article as ours. Those participating in these efforts include Drs. Roberto Bernabei, G. Iain Carpenter, Jean-Noël DuPasquier, Dinus Frieters, Robert Heinrich, Naoki Ikegami, Cora van der Kooij, Gunnar Ljunggren, Miel Ribbe, Marianne Schroll, Malgosia Zlobicki. This work would also not have been possible without the efforts of the others on the RAI Development Team (Drs. Catherine Hawes, John Morris, Charles Phillips, and Vince Mor) and on the RUG-III Development Team (Dr. Don Schneider, Dr. William Foley, Marie Gavazzi, and Dr. Robert Burke). We also thank Elizabeth Cornelius and Alan Friedlob of the Health Care Financing Administration who commented on earlier versions of this article and Carol Lynn Dacko of the University of Michigan for her technical assistance throughout these developments.

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Figure 4
MINIMUM DATA SET FOR NURSING HOME RESIDENT ASSESSMENT AND CARE SCREENING (MDS)
BACKGROUND INFORMATION/INTAKE AT ADMISSION

I. IDENTIFICATION INFORMATION

| 1. RESIDENT NAME | (First) | (Middle Initial) | (Last) |
|-------------------|---------|-----------------|--------|

2. DATE OF CURRENT ADMISSION

| Month | Day | Year |
|-------|-----|------|

3. MEDICARE NO. (SOC. SEC. or Comparable No., if Medicare No.)

| Federal No. |
|-------------|

4. FACILITY PROVIDER NO.

| Federal No. |
|-------------|

5. GENDER

| 1. Male | 2. Female |
|---------|-----------|

6. RACE/ETHNICITY

| 1. American Indian/Aleut Native | 2. Asian/Pacific Islander | 3. Black, not of Hispanic origin | 4. Hispanic | 5. White, not of Hispanic origin |
|---------------------------------|--------------------------|-------------------------------|-------------|-----------------------------|

7. BIRTHDATE

| Month | Day | Year |
|-------|-----|------|

8. LIFETIME OCCUPATION

| Res. primary language is a language other than English |
|-----------------------------------------------------|
| 0. No | 1. Yes | (Specify) |

9. RESIDENTIAL HISTORY-PAST 5 YEARS

| (Check all settings resident lived in during 5 years prior to admission) |
|-------------------------------------------------------------|
| Prior stay at this nursing home | 
| Other nursing home/residential facility | 
| M/H/psychiatric setting | 
| MR/DD setting | 
| NONE OF ABOVE | 

10. MENTAL HEALTH HISTORY

| Does resident's RECORD indicate any history of mental retardation, mental illness, or any other mental health problem? |
|------------------------------------------------------------------------------------------------------------------|
| 0. No | 1. Yes |

11. CONDITIONS RELATED TO MR/DD STATUS

| (Check all conditions that are related to MR/DD status, that were manifested before age 22, and are likely to continue indefinitely) |
|------------------------------------------------------------------------------------------------------------------|
| Not applicable—no MR/DD (Skip to Item 12) | 
| MR/DD with Organic Condition | 
| Cerebral palsy | 
| Down's syndrome | 
| Autism | 
| Epilepsy | 
| Other organic condition related to MR/DD | 
| MR/DD without organic condition | 
| Unknown | 

12. MARITAL STATUS

| 1. Never Married | 2. Widowed | 3. Divorced | 4. Separated |
|------------------|------------|------------|-------------|

13. ADMITTED FROM

| 1. Private home or apt. | 2. Acute care hospital | 3. Nursing home | 4. Other |
|-------------------------|------------------------|-----------------|---------|

14. LIVED ALONE

| 0. No | 1. Yes | 2. In other facility |
|-------|-------|---------------------|

15. ADMISSION INFORMATION AMENDED

| (Check all that apply) |
|------------------------|
| Accurate information unavailable earlier | 
| Observation revealed additional information | 
| Resident unstable at admission | 

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Signature of RN Assessment Coordinator: 

Signatures of Others Who Completed Part of the Assessment:
Figure 4 - Continued

**MINIMUM DATA SET FOR NURSING HOME RESIDENT ASSESSMENT AND CARE SCREENING (MDS)**
(Status in last 7 days, unless other timeframe indicated)

### SECTION A. IDENTIFICATION AND BACKGROUND INFORMATION

| 1. ASSESSMENT DATE | Month | Day | Year |
|--------------------|-------|-----|------|
|                    |       |     |      |

| 2. RESIDENT NAME |
|------------------|
| (First)          |
| (Middle Initial) |
| (Last)           |

| 3. SOCIAL SECURITY NO. |
|------------------------|
|                        |

| 4. MEDICAID NO. (If applicable) |
|---------------------------------|
|                                 |

| 5. MEDICAL RECORD NO. |
|-----------------------|
|                       |

| 6. REASON FOR ASSESSMENT |
|--------------------------|
| 1. Initial admission assess. |
| 2. Hospice/Medicare
  reassess. |
| 3. Readmission assessment |
| 4. Annual assessment |

| 7. CURRENT PAYMENT SOURCE(S) FOR N.H. STAY |
|-------------------------------------------|
| Medicaid | Medicare | Self pay/Private insurance | CHAMPUS | Other |

| 8. RESPONSIBILITY LEGAL GUARDIAN |
|---------------------------------|
| Legal guardian                  |
| Other legal oversight           |
| Durable power of attorney       |
| Health care proxy                |

| 9. ADVANCED DIRECTIVES |
|-----------------------|
| (For those items in support of documentation in the medical record, check all that apply) |

| 10. DISCHARGE PLANNED WITHIN 2 MOS. |
|------------------------------------|
| 0. No | 1. Yes | 2. Unknown/uncertain |

| 11. PARTICIPATE IN ASSESSMENT |
|-------------------------------|
| a. Resident                     |
| b. Family                      |
| 0. No                          |
| 1. Yes                         |
| 2. No                          |
| 2. No family                   |

| 12. SIGNATURES |
|----------------|
| Signature of RN Assessment Coordinator |

| Signatures of Others Who Completed Part of the Assessment |
|----------------------------------------------------------|

### SECTION B. COGNITIVE PATTERNS

| 1. COMA/VEGETATIVE STATE |
|---------------------------|
| (Resident requires no conscious acknowledgment) |
| 0. No                         |
| 1. Yes (Skip to SECTION D)    |

| 2. MEMORY |
|-----------|
| Recall of what was learned or known |
| a. Short-term memory OK—seems to recall after 5 minutes |
| b. Long-term memory OK—seems to recall later time |
| 0. Memory OK |
| 1. Memory problem |

| 3. MEDICAL RECALL ABILITY |
|---------------------------|
| (Check all that resident normally able to recall during last 7 days) |
| a. Current season         |
| b. Location of own room   |
| c. Staff names/faces      |

### SECTION C. COMMUNICATION/HEARING PATTERNS

| 1. HEARING (With hearing appliance, if used) |
|---------------------------------------------|
| 0. Hears adequately—normal talk, TV, phone |
| 1. Minimal difficulty when in quiet setting |
| 2. Hears in social situations only—speaker has to adjust tone |
| 3. Highly impaired/difficulty in useful hearing |

| 2. COMMUNICATION DEVICES/TECHNIQUES |
|------------------------------------|
| (Check all that apply) |

| 3. MODES OF EXPRESSION |
|------------------------|
| (Check all used by resident to make needs known) |
| a. Speech              |
| b. Writing messages    |
| c. Communication board |
| d. Other               |

| 4. MAKING SELF UNDERSTOOD |
|---------------------------|
| (Express information content—how well able) |
| 0. Understood             |
| 1. Usually Understood—difficulty finding words or finishing thoughts |
| 2. Sometimes Understood—ability is limited to making concise requests |
| 3. Rarely/Never Understood |

| 5. ABILITY TO UNDERSTAND OTHERS |
|-------------------------------|
| (Understanding verbal information content—how well able) |
| 0. Understands |
| 1. Usually understands—may miss some parts of message |
| 2. Sometimes understands—responds adequately to simple, direct communication |
| 3. Rarely/never understands |

| 6. CHANGE IN COMMUNICATION/HEARING |
|-----------------------------------|
| Resident's ability to express, understand or hear information has changed over last 90 days |
| 0. No change                        |
| 1. Improved                        |
| 2. Deteriorated                     |

### SECTION D. VISION PATTERNS

| 1. VISION |
|-----------|
| Ability to see in adequate light and with glasses if used |
| 0. No glasses used |
| 1. Adequate—sees fine detail, including regular print in newspapers/ books |
| 2. Impaired—sees large print, but not regular print in newspapers/books |
| 3. Highly impaired—vision not able to see newspaper headlines, appears to follow objects with eyes |

| 2. VISUAL LIMITATIONS/DIFFICULTIES |
|------------------------------------|
| (See vision problems—decreased peripheral vision) |
| a. Scotoma |
| b. Amblyopia |
| c. Anopia |
| d. color blindness |

| 3. VISUAL APPLIANCES |
|----------------------|
| Glasses, contact lenses, lens implant, magnifying glass |
| 0. No |
| 1. Yes |

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= Code the appropriate response
= Check all the responses that apply

August 20, 1990
**SECTION L. ORAL/NUTRITIONAL STATUS**

1. **ORAL PROBLEMS**
   - Chewing problem
   - Swallowing problem
   - Mouth pain
      - NONE OF ABOVE

2. **HEIGHT AND WEIGHT**
   - Recent height (a.) in inches and weight (b.) in pounds. Weight based on most recent status in last 30 days; measure weight consistently in a, b. a. b. c. Weighs less (i.e., 5%+ in last 30 days; or 10% in last 180 days)
   - 0. No 1. Yes

3. **NUTRITIONAL PROBLEMS**
   - Complains about the taste of many foods
   - Insufficient fluid; dehydrated
   - Did NOT consume all/most all fluids provided during last 3 days
   - 0. No 1. Yes

4. **NUTRITIONAL APPROACHES**
   - Parenteral/IV
   - Feeding tube
   - Mechanically altered diet
   - Syringe (oral feeding)
   - Therapeutic diet
   - NONE OF ABOVE

**SECTION M. ORAL/DENTAL STATUS**

1. **ORAL DISEASES AND CONDITIONS**
   - Conditions/diseases make residents cognitive, ADL, or behavior status unstable—fluttering, precocious, or deteriorating
   - Resident experiencing an acute episode or a flare-up of a recurrent/chronic problem
   - NONE OF ABOVE

2. **PRESSURE ULCERS**
   - Code for highest stage of pressure ulcer
   - 0. No 1. Yes

3. **HISTORY OF RESOLVED CURED PRESSURE ULCERS**
   - Resident had had a pressure ulcer that was resolved in last 90 days
   - 0. No 1. Yes

**SECTION N. SKIN CONDITION**

1. **STATIONS OF PRESSURE ULCERS**
   - Open lesions other than status or pressure ulcers (e.g., cuts)
   - Skin desensitized to pain, pressure, discomfort
   - Protective/preventive skin care
   - Turning/repositioning program
   - Pressure relieving beds, bariatric pads (e.g., egg crate pads)
   - Wound care/treatment (e.g., pressure ulcer care, surgical wound)
   - Other skin care/treatment
   - NONE OF ABOVE

**SECTION O. MEDICATION USE**

1. **NUMBER OF MEDICATIONS**
   - Record the number of different medications used in the last 7 days; enter "0" if none used

2. **NEW MEDICATIONS**
   - resident has received new medications during the last 90 days
   - 0. No 1. Yes

3. **INJECTIONS**
   - Record the number of days injections of any type received during the last 7 days

4. **DAYS RECREATED THE FOLLOWING MEDICATIONS**
   - Record the number of days during the last 7 days; enter "0" if not used; enter "1" if long-acting meds used less than weekly
   - Antipsychotics
   - Antidepressants
   - Antianxiety/hypnotics

5. **PREVIOUS MEDICATION RESULTS**
   - SKIP this question if resident currently receiving antipsychotics, antidepressants, or antianxiety/hypnotics—otherwise code correct response for last 90 days
   - Resident has previously received psychoactive medications for a mood or behavior problem, and these medications were effective (without undue adverse consequences)
   - 0. No 1. Yes 2. No tests performed
   - 1. Drugs were effective
   - 2. Drugs were not effective
   - 3. Drug effectiveness unknown

**SECTION P. SPECIAL TREATMENT AND PROCEDURES**

1. **SPECIAL TREATMENTS AND PROCEDURES**
   - Check treatments received during the last 14 days
   - Chemotherapy
   - Radiation
   - Chemotherapy
   - Translutions
   - Dialysis
   - Other
   - Dressing
   - Other
   - Suctioning
   - Other
   - Therapy—check treatments used during the last 14 days
   - Speech—language pathology and audiology services
   - Occupational therapy
   - Physical therapy
   - Psychological therapy (any licensed professional)
   - Respiratory therapy

2. **ABNORMAL LAB VALUES**
   - Has the resident had any abnormal lab values during the last 90 days?
   - 0. No 1. Yes 2. No tests performed

3. **DEVICES AND RESTRAINTS**
   - Use the following codes for last 7 days:
   - 0. Not used
   - 1. Used less than daily
   - 2. Used daily
   - Trach. care
   - NONE OF ABOVE

**Figure 4 - Continued**
Figure 5
Resource Utilization Groups, Version II (RUG-II) classification system

Heavy rehabilitation
Physical or occupational therapy 5 times a week for 30 minutes or more a day.

Yes

No

Special care
ADL index greater than 4 and one of the following:
• Comatose.
• Nasogastric feeding.
• Quadriplegia.
• Multiple sclerosis.
• Stage 4 decubitus.
• Suctioning.

Yes

No

Clinically complex
• Oxygen therapy.
• Wound/lesion care.
• Chemotherapy.
• Transfusion.
• Cerebral palsy.
• Urinary tract infection.
• Hemiplegia.

Yes

No

Severe behavioral problems
• Physical aggression.
• Verbal abuse.
• Regressive behavior.
• Hallucinations.

Yes

No

Reduced physical functions
• All remaining residents.

ADL index
• Based on toileting, eating, and transfer.
• Range: 3 (Independent) - 10

ADL index
Table 2 provides the key for RUG-II groups.

NOTES: ADL is activities of daily living.