Quality Improvement in Long-term Care

The purpose of this column is to discuss innovations and quality improvement efforts in a variety of long-term care settings. These issues are of importance to healthcare professionals as our nation faces the burgeoning growth of the aging population, creating increased demand for improved and innovative long-term care services. This column is coordinated by Marilyn J. Rantz, PhD, RN, FAAN, NHA, e-mail: rantzm@missouri.edu.

Advances in Measuring Quality of Care in Nursing Homes
A New Tool for Providers, Consumers, Regulators, and Researchers

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Over the past 12 years, members of the Minimum Data Set (MDS) and Quality Research Team at the University of Missouri - Columbia have been working with the Missouri Department of Health and Senior Services to improve care in Missouri nursing homes. The team conducted initial qualitative studies that explored the multidimensional aspects of quality of nursing home care.1 Using grounded theory methods, dimensions important to consumers and overlapping dimensions important to providers, healthcare professionals, and regulators were identified.2 The quality dimensions were operationalized in a theoretical model of quality of nursing home care.1,2 We learned from the studies that quality of care in nursing homes is a concept that encompasses broad dimensions of not only technical care provided but also the context or environment in which the care is delivered.

Guided by the theoretical work, which was confirmed by literature, substantial preliminary work was conducted on a 47-item instrument titled Observable Indicators of Nursing Home Quality Instrument (OIQ), which can be used to measure quality of nursing home care.3-5 The OIQ is answered by a 5-point rating scale for each question, with anchoring descriptors for each point. In developmental field tests, nurse observers were...
oriented to use the instrument with a User's Guide that provides directions about how to perform a 20 to 30 minute tour of a facility prior to answering the questions.

The instrument was designed to guide research staff, professionals, consumers, and possibly regulators in evaluating quality of care on a brief inspection of a nursing home. The OIQ includes important dimensions, such as resident-staff interaction and environment, which are difficult to capture on available large data set outcome measures, such as those posted on the nursinghomecompare.gov Web site. When combined with outcome measures, the instrument is viewed as having the potential to create a more complete view of quality of nursing home care. Our column will share with the reader an overview of the results following a 3-year research project funded by the National Institute of Nursing Research (NINR) of the National Institutes of Health (NIH) to further develop the OIQ. We will offer some practical guidance for the use of the QIO in quality improvement programs.

OVERVIEW OF RESULTS OF THE NINR-FUNDED FIELD STUDY

The primary aim of the study was to complete the development of the OIQ for use by researchers studying the dimensions of care quality in nursing homes. A secondary study aim was to assess the psychometric properties of the OIQ instrument when used by consumers and those trained as nursing home regulators. Complete results are described in a psychometric article in review at this time (M. J. Rantz et al, unpublished data, 2005).

The sample of facilities was solicited from 3 states, Missouri, Wisconsin, and Minnesota. Data were collected from 407 different nursing homes (Missouri, n = 257; Wisconsin, n = 84; Minnesota, n = 66). Registered nurses (RNs), consumers, and retired regulators made a total of 694 visits in the 3 states. For interrater purposes, a pair of observers visited 114 Missouri facilities: 55 facilities by a pair of RNs, 30 facilities by a pair of consumers, and 29 by a pair of retired regulators. Test-retest visits were made to 108 Missouri facilities, with RNs visiting 49 facilities, consumers visiting 30 facilities, and retired regulators visiting 29 facilities.

Exploratory and confirmatory factor analysis and the methods of Classical Test Theory and Generalizability Theory were used to study the reliability and validity of data obtained by the observers. Item analysis and exploratory factor analysis resulted in a final instrument of 30 reliable items with a coherent 7-factor structure. The 7 factors were named by the research team: Care Delivery, Grooming, Interpersonal Communication, Environment: Access, Environment: Basics, Environment: Homelike, and Odors. A multiconstruct confirmatory factor analysis confirmed the 7-factor structure and further assessment revealed 2 higher-order factors, which were defined as Process and Structure, and a third-order factor that was defined as Quality.

The revised 30-item instrument was then analyzed for interrater and test-retest correlations. Coefficient αs were calculated for all first RN visits to all facilities in the study. Acceptable interrater and test-retest reliability evidence in addition to strong internal consistency for the subscales and the total instrument were revealed. As a final step, a Generalizability Theory analysis was performed to combine the sources of error into a single coefficient. These results were applied to a Decision Study that revealed the reliability of the instrument can be improved by increasing the numbers of visits from 1 to 2 or by increasing the numbers of raters from 1 to 2.

Finally, construct validity was examined using survey citations, MDS-derived Quality Indicators, and MDS-derived Quality Measures. Survey citations were obtained from the federal Medicare nursinghomecompare.gov Web site. Survey citations are the results of regulator visits to facilities to determine compliance with state and federal nursing home regulations. Citations were significantly correlated with the total Quality score, the higher level subscales (Process and Structure), and all subscales.
A single Quality Score was calculated for each facility using 9 Quality Indicator scores found to be most sensitive to discriminate between facilities with a range of quality resident outcomes. The facilities were ranked on the basis of their Quality Score into 3 groups (good, average, poor), and correlations were used to determine if there was an association between the OIQ score and the facility ranking. Only the communication subscale was significantly correlated; however, box plots revealed trends of better OIQ scores for facilities in the good group than in the poor group for most subscales (care, environment-homelike, environment-basic, odor, communication, and grooming); the summative subscales (process, structure); and the total OIQ score.

Quality Measures were obtained from the nursinghomecompare.gov Web site and used to aggregate the facilities into 3 groups on the basis of average percentile rank of the facility scores for 5 Quality Measures: activity of daily living, pressure ulcer, pain, restraints, and infection. No statistical differences between the 3 percentile groups and the OIQ score were found.

Scoring guidelines for each subscale and the total score of the OIQ were developed on the basis of the distribution of scores from all the observations. OIQ scores above the 80th percentile were chosen as suggestive of a quality facility; scores below the 20th percentile were viewed as suggestive of quality problems. The extensive work performed on the OIQ over the past several years and the psychometric evidence from the recent NINR-funded research indicates that the OIQ is a brief instrument that evaluates the multidimensional concept of nursing home quality of care in a reliable and valid manner (M. J. Rantz et al., unpublished data, 2005). Copies of the instrument with a user's guide can be obtained from the lead author. Excerpts of the instrument and more information are available at www.nursinghomehelp.org Web site maintained by our research team for providers, consumers, and other researchers. A consumer version of the OIQ and guide for selecting a nursing home for a loved one, The New Nursing Homes: A 20-Minute Way to Find Great Long Term Care is available from Fairview Press at 1-800-544-8207 or www.fairviewpress.org and online book stores.

**USING THE OIQ IN QUALITY IMPROVEMENT PROGRAMS**

For nursing facilities, there are advantages of routinely using the OIQ to evaluate their overall quality of care. On the basis of the findings of our most recent field testing (M. J. Rantz et al., unpublished data, 2005), we suggest 2 observers tour a facility on the same day, at the same time; not discuss their observations; and then each independently score an instrument. Their scores are averaged for each item, and subscale scores and total scores are calculated (directions are provided on the instrument). Using 2 raters and averaging their scores improves the reliability of the instrument. An alternative is for 1 rater to tour on 2 occasions, such as touring on 1 day and scoring a first instrument, then touring the next day or later in the week and scoring a second instrument (without referring to the first). Then the 2 instruments are averaged for each item, and subscale scores and total scores are calculated.

One plan for routine use of the OIQ would be to ask a board member, community members, or particular staff to team up each month to complete the instruments and report results to a quality improvement team in the facility. Another plan might be to have members of a facility quality improvement team tour the facility and score the instrument monthly; in this case, it would be important for the staff member to approach the facility after being outside for some time so that odors can be detected more readily.

Having access to a valid and reliable instrument that measures nursing home care quality can be a huge help to facilities as they approach quality improvement. Fresh perspectives and challenges to the quality improvement team are necessary to help them continuously identify issues to improve and
also have ways to measure their improvement. Displaying monthly results of the OIQ using line graphs of results from prior months for each subscale (care delivery, grooming, interpersonal communication, environment: access, environment: basics, environment: homelike, and odors) can illustrate areas in need of attention as well as improvements; graphs of the summative subscales (process, structure) and the total OIQ score can illustrate overall progress. A sample of a graph illustrating the monthly summative and overall scores for a facility is presented in Figure 1.

We encourage nursing facilities to use the OIQ and offer advice to us and others about its usefulness. A residential care version is under development with additional field-testing planned.

REFERENCES
