Quality Assessment in Nursing Homes by Systematic Direct Observation: Feeding Assistance

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Background. Direct observation of care is an important data source for nursing home (NH) quality assessment, especially in light of evidence that chart information is inaccurate or incomplete for many daily care areas. The purpose of this study was to describe a standardized feeding assistance observational protocol that is designed for routine use by external (survey teams) and internal (licensed NH staff) quality assurance personnel to (i) maximize the amount of useful information gained from relatively brief observational periods; (ii) provide specific rules of measurement, which allow for replication and valid comparisons between NHs; and (iii) provide specific scoring rules that allow defensible categorical statements to be made about feeding assistance care quality within the NH.

Methods. Four feeding assistance care quality indicators (QIs) were defined and operationalized in this study for 302 long-term residents in 10 skilled NHs: (i) Staff ability to accurately identify residents with clinically significant low oral food and fluid intake during mealtimes; (ii) Staff ability to provide feeding assistance to at-risk residents during mealtimes; (iii) Staff ability to provide feeding assistance to residents identified by the Minimum Data Set as requiring staff assistance to eat; and (iv) Staff ability to provide a verbal prompt to residents who receive physical assistance at mealtimes.

Results. There were significant differences between facilities for three of the four QIs. The proportion of participants in each facility who staff “failed” the QIs ranged as follows: (Quality Indicator i) 42% to 91%; (ii) 25% to 73%; (iii) 11% to 82%; and (iv) 0% to 100%.

Conclusions. A standardized observational protocol can be used to accurately measure the quality of feeding assistance care in NHs. This protocol is replicable and shows significant differences between facilities with respect to accuracy of oral intake documentation and the adequacy and quality of feeding assistance during mealtimes.
observational periods so that the protocol is feasible to implement by external and internal quality assurance personnel; (ii) provide rules of measurement that allow for replication and valid comparisons between facilities; and (iii) provide scoring rules that allow categorical statements to be made about feeding assistance quality within the NH. It is important that NH staff clearly understand the data sources and scoring rules that lead to conclusions about care quality. This understanding should increase staff acceptance of the validity of the survey process and also provide them with a method to monitor care quality on a routine basis for improvement purposes.

The following questions were addressed: (i) What specific staff behaviors relevant to evaluating the quality of feeding assistance can reliably be measured by observers and what rules should govern these observations? (ii) How stable are the observational data over time? (iii) How can the observational data be translated into indicators that reflect the quality of feeding assistance within a facility?

**Methods**

**Subjects and Setting**

Residents in 10 facilities, two of which were nonprofit, participated in this study. Facilities ranged in size from 59 to 171 skilled nursing beds, with 901 total occupied beds across the 10 homes at the time of the study. Resident-to-nurse aide staff ratios, as reported by the directors of nursing at each facility, ranged from seven to nine residents per nurse aide during the day shift (7 am to 3 pm: breakfast and lunch meals) and eight to 13 residents per nurse aide during the evening shift (3 pm to 11 pm: dinner meal).

Consent procedures were approved by the University of California, Los Angeles, internal review board for research with human subjects. Of the total resident population in the 10 homes (901), 337 (37%) provided informed, written consent to participate. A total of 35 consented residents had a feeding tube. Observational data were collected for the remaining 302 participants, who were capable of oral food and fluid intake.

**Measures**

**Observational protocol.**—The observational form and behavioral definitions used to guide the observations are presented in Figure 1. Initial pilot testing of the observational protocol was conducted across all three mealtimes (i.e., breakfast, lunch, and dinner) with seven different observers and 94 residents in two NHs prior to this project. Periodic reliability estimates were then conducted throughout the data collection period in the 10 NHs to prevent observer drift. Interrater reliability coefficients for all data elements shown in Figure 1 ranged from .877 to .986 \((p < .001)\), and these reliability coefficients did not differ by location of observation (i.e., dining room vs in room or hallway) for those data elements that could be measured in both locations.

Attempts were made to observe all consented residents for two meals on two consecutive days (i.e., one meal per day, typically breakfast or lunch). Approximately one half of the participants were observed for breakfast on day 1 and lunch on day 2, while the other half of participants were observed for lunch on day 1 and breakfast on day 2. A second set of mealtime observations was completed on 52 residents in two NHs (i.e., two lunch meals) after 1 month to determine the stability over time of the data elements used to calculate the quality indicators. Stability coefficients ranged from .34 \((p = .015, \text{presence or absence of verbal prompting})\) to .64 \((p < .001, \text{presence or absence of physical assistance})\). Total amount of time in minutes that NH staff were directly observed to provide any type of assistance to residents and estimated oral intake values had stability coefficients of .60 and .59 \((p < .001)\), respectively.

Preliminary research indicated that one observer could use the observational form to record feeding assistance information for six to eight residents eating within one geographic area (i.e., all in the dining room or in their rooms within the same hallway). Thus, for this study, observational staff divided the dining room into sections of two to three tables or a contiguous set of six to eight rooms located within the same hall if residents were not eating in the dining room. Residents eating in the dining room were observed continuously throughout the mealtime period (i.e., from the time of tray delivery to the time of tray pick-up by NH staff). Research staff could directly observe types of feeding assistance provided (e.g., verbal prompting or physical) for only those residents in the dining room, not those who ate in their rooms, because this would require entering each room and losing visual contact with all other rooms targeted for observation. Therefore, the only data elements recorded when residents ate in their rooms were how frequently NH staff entered their rooms, how long they stayed, and the total amount of food and fluid consumed by residents at the point their trays were removed by NH staff. After each meal, observers estimated resident consumption of each food and fluid item on the meal tray using a percentage scale (0% to 100%). Estimates of percent consumed based on direct observations have been shown to be reliable for NH residents (5, 18). Interrater reliability for total percentage consumed in this study (42 meals) was .986 \((p < .001)\). Percentage estimates were used because this same method is used by nurse aides to estimate residents’ intake at each meal and to identify those at risk for undernutrition due to low oral intake \((1, 2, 5, 19)\).

For the in-room observations, we assumed that NH staff (i.e., nurse aides) were providing assistance to residents for the duration of time that they were in the resident’s room during the mealtime period. If two residents shared a room, this estimate (i.e., the total amount of time that staff spent in the residents’ room) was divided by two.

**Quality indicators for feeding assistance: scoring rules.**—The information generated by the observational protocol can be reported as continuous data (e.g., average duration of assistance received by each resident) or a quality indicator score (e.g., proportion of residents within a facility who had low oral intake but who did not receive assistance from NH staff) during mealtime. There are two primary advantages of a quality indicator (QI) score. First, a QI score has the potential to highlight clinically significant quality problems that may not be easily captured by continuous
data. Second, it efficiently summarizes the data into understandable quality categories for which feeding assistance care can be scored as either “passing” or “failing” for individual residents and mealtime periods. The percentage of residents who receive a pass or fail score provides a summary measure of quality useful for making comparisons between NHs or within a facility over time (e.g., staff shifts, mealtime periods, Minimum Data Set [MDS] quarterly assessment periods). The rules and rationale that guided the scoring of four possible QIs related to feeding assistance are presented below. These four feeding assistance QIs, which are based on previous work (20), were operationalized into specific NH staff behaviors that could be reliably observed during the mealtime period. The scoring rule for each QI reflects a liberal approach that maximized the opportunity for a facility to pass.

(i) Staff ability to accurately identify residents with clinically significant low oral food and fluid intake during mealtimes.

### Scoring Rule

**Scoring Rule:** Score as “fail” any resident who consumes less than 50% of the food and fluid items on his or her meal tray based on direct observation, but who is identified by NH staff (i.e., chart documentation of percent intake for the same meal as the observation) as consuming equal to or greater than 60%.

**Rationale:** The MDS criterion for low oral intake is defined as “leaves 25% or more of food uneaten” or consumes less than 75% of most meals (19,21). Recent evidence, however, suggests that NH residents who consistently consume less than 50% of most meals are at a significantly higher risk for weight loss (10). Thus, if NH staff document that a resident consumed more than 60% of a meal when, in fact, the resident ate less than 50%, it is likely NH staff are failing to identify a clinically significant oral intake problem for that resident.

(ii) Staff ability to provide assistance to at-risk residents.

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(iv) Staff ability to provide assistance to at-risk residents.
tray based on direct observation and who receives 1 minute or less of assistance from NH staff during the mealtime period.

**Rationale:** If residents who consume less than 50% of most meals also receive 1 minute or less of feeding assistance at mealtimes from NH staff, then NH staff members are providing potentially substandard feeding assistance, are failing to recognize an oral intake problem for an individual resident, or both. Using the 1-minute criterion allows for delivering and removing a meal tray even if no verbal prompting or physical assistance to eat is provided to the resident.

(iii) Staff ability to provide feeding assistance to residents identified during their MDS assessment as requiring staff assistance to eat.

**Scoring Rule:** Score as “fail” any resident who is rated on the most recent MDS assessment as requiring feeding assistance (MDS Section G. Physical Functioning, item 1h. Eating, rated 2 “Limited assistance,” 3 “Extensive assistance,” or 4 “Total dependence”) but who receives less than 5 minutes of assistance from NH staff during mealtime.

**Rationale:** NH staff should be providing assistance to residents whom they have identified (i.e., documented on the MDS) as requiring staff assistance to eat. While rule 2 might capture residents who have not been identified by NH staff as requiring assistance, rule 3 addresses whether staff are providing adequate assistance to residents whom they have identified as needing help to eat. This scoring rule uses a minimum of 5 minutes of assistance, as opposed to only 1 minute used in scoring rule 2, because residents who are rated as requiring “extensive” or “total” assistance (i.e., are completely dependent on staff to eat) are included in this target group. A 5-minute minimum for this highly dependent group is extremely conservative in terms of these residents’ feeding assistance needs.

(iv) Staff ability to provide a verbal prompt to residents who receive physical assistance at mealtimes.

**Scoring Rule:** Score as “fail” any resident who receives physical assistance from NH staff during mealtime without also receiving at least one episode of verbal prompting directed toward eating during the meal (e.g., “why don’t you try your beans?”). The duration of the verbal prompt is not considered. This quality indicator can only be scored for residents who eat meals in the dining room because type of assistance must be considered.

**Rationale:** Graduated prompting protocols using verbal prompting have been shown to increase residents’ independent eating behaviors and oral food and fluid intake. Multiple groups have suggested that verbal prompting coupled with physical assistance defines optimal feeding assistance care (8,14–17,20). Furthermore, observational data indicate that NH staff often provide excessive physical assistance to residents who could otherwise eat independently with just verbal prompting or encouragement (7,8,14,17).

**RESULTS**

**Subjects and Setting**

The 302 participants were typical of a community-based, long-stay NH population in that they were predominately female (74%) and white (69%). Their average age was 82.2 (±12.0), and their average length of residency in the NH was 18.3 (±20.2) months. The average MDS rating for feeding assistance need (MDS Item G1h) was 1.6 (±1.6), with a full range present (0 to 4) and a mode of 0 (“independent”). The average MDS recall score (MDS items 8a–d) of participants was 2.62 (±1.44), with a full range present from 0 (rated by NH staff as incapable of recalling any of the four items accurately: current season, location of own room, staff names/faces, that he or she is in a NH) to 4 (rated by NH staff as capable of accurate recall for all four items). A total of 75% of the participants scored two or higher on the MDS recall scale (25). There were no significant differences between homes on any of these participant characteristics.

**Mealtime Observations**

We attempted to conduct two mealtime observations for each of the 302 participants; however, 18 participants had only one complete mealtime observation because they were taken out of the facility by family, were in therapy, or were transferred to the hospital after the first day. A total of 586 meals were, thus, observed for the 302 participants across the 10 NHs, with the number of residents and meals observed in each NH listed in the first and second columns of Table 1, respectively. Most of the observations (533 meals, 91%) were conducted during breakfast and lunch; and, there were no significant site differences in the proportion of breakfast versus lunch observations. Participants in this study were in the dining room for approximately one half of the observations (281 meals, 48%), typically the lunch meal. They were observed eating in their rooms or the hallway for the remainder of the meals (305 meals, 52%). There were significant differences between NHs in the number of residents who ate meals in the dining room (Table 1, column 3) with 100% of the sample in site 10 eating all meals in the dining room versus only 27% of the participants in site 8 eating a portion (17%) of their meals in the dining room (χ² = 192.50, p < .001). There was no difference in the MDS rating for feeding assistance need between residents who ate meals in their rooms or hallway versus those who ate in the dining room (MDS item G1h; 1.0 ± 1.5 vs 1.4 ± 1.6, respectively), with both groups rated as requiring “supervision,” on average. However, residents received significantly more minutes of assistance from NH staff when they ate their meals in the dining room versus their rooms or the hallway (5.34 ± 10.56 vs 3.45 ± 6.46 minutes of staff assistance, respectively; t = −2.71, p < .01); and, they also consumed a significantly larger percentage of their meal (68% ± 24% vs 57% ± 30%, respectively, t = −2.42, p < .05).

**Quality Indicators for Feeding Assistance**

Quality indicators one and two are both relevant only to participants who consumed less than 50% of their meal(s) and were, therefore, considered to be at particularly high risk for weight loss due to low oral food and fluid intake (10). A total of 137 participants (45%) consumed less than 50% of one or both observed meals (total of 182 meals). The percentage of residents eating less than 50% did not
significantly differ between NHs, with a range from 40% (Table 1, column 4, NHs 7 and 8) to 52% (NHs 3 and 10). The proportion of meals of which residents consumed less than 50% did not significantly differ by location (28% of dining room meals vs 34% of room or hallway meals). Quality indicators one and two address assessment and intervention issues, respectively, with this at-risk group. First, are NH staff correctly identifying these low intake values (QI 1); and, second, are NH staff providing feeding assistance to these at-risk residents (QI 2)?

**Quality indicator one: staff ability to accurately identify residents with clinically significant low oral food and fluid intake during mealtime.**—Table 1, column 5 shows the proportion of residents for which NH staff chart documentation showed values equal to or greater than 60% for the 137 participants and 182 meals for which direct observations showed a percent consumed less than 50%. A total of 85 (62%) participants across the 10 sites failed this QI. There were significant differences between the 10 sites, with “failure” proportions ranging from 24% (site 5) to 91% (site 4) ($\chi^2 = 21.01, p < .01$). The failure proportions did not differ significantly by location (dining room vs in room or hallway) for the group across all NHs and meals.

**Quality indicator two: staff ability to provide assistance to at-risk residents.**—Table 1, column 6 shows the proportion of participants who consumed less than 50% of their meal(s) and received 1 minute or less of NH staff assistance to eat (MDS G1h ≥ 2). MDS > 1 and Assist < 5 min = number (percent) of residents who ate less than 5 minutes of assistance from NH staff during at least one observed meal. Of the 76 participants who ate for at least one meal in the dining room, received physical assistance from NH staff, but did not receive at least one episode of verbal prompting from NH staff. QI = quality indicator; NH = nursing home; CNA = certified nurse aide; MDS = Minimum Data Set.

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Notes: Meals = number of resident-meals observed. Dining Room Meals = number (percent) of resident meals observed in the dining room. <50% = number (percent) of residents who consumed less than 50% of at least one observed meal. <50% and CNA ≥ 60% = number (percent) of residents who consumed less than 50% and had chart documentation of ≥60% for at least one observed meal. <50% and Assist ≤ 1 min = number (percent) of residents who consumed less than 50% and received ≤1 minute of assistance from NH staff during at least one observed meal. MDS > 1 = number (percent) of residents rated on the MDS as requiring staff assistance to eat (MDS G1h ≥ 2). MDS > 1 and Assist ≤ 1 min = number (percent) of residents rated on the MDS as requiring staff assistance to eat (MDS G1h ≥ 2) and who received less than 5 minutes of assistance from NH staff during at least one observed meal. MDS > 1 and Assist < 5 min = number (percent) of residents who ate for at least one meal in the dining room, received physical assistance from NH staff, but did not receive at least one episode of verbal prompting from NH staff. QI = quality indicator; NH = nursing home; CNA = certified nurse aide; MDS = Minimum Data Set.

Denominator includes participants with oral intake < 50% for one or both observed meals.

Denominator includes participants rated on the MDS as requiring assistance to eat (MDS G1h = 2, 3 or 4); includes all mealtime observations (i.e., in room + dining room).

**Denominator includes participants who eat in the dining room (no in-room observations) and receive physical assistance.**
of participants who failed this quality indicator within each of the 10 sites. These “failure” proportions also showed significant differences between sites, with a range from only 11% (site 10) to 82% (site 5) ($\chi^2 = 26.16, p < .01$). Again, similar to the results of quality indicators one and two, the failure proportions did not differ significantly by location (dining room vs in room or hallway) for the group across all NHs and meals.

Quality indicator four: staff ability to provide a verbal prompt to residents who receive physical assistance at mealtimes.—Indicator four is related to the quality of the assistance NH staff members provide to residents during mealtime. Because it was necessary to determine type of assistance (i.e., verbal prompting vs physical assistance) to score this quality indicator, only the 167 participants (55%) who ate 281 meals (48%) in the dining room were included in the calculation. Facilities in which few participants were observed eating in the dining room (sites 2, 6, and 8), thus, had few participants for whom this quality indicator could be scored.

A total of 60 participants received physical assistance from NH staff during a total of 89 meals in the dining room. Of these, 21 (35%) participants failed to receive at least one verbal prompt from NH staff at any point during the observed meal. There was no difference in the MDS recall scores of those who received verbal prompts from NH staff in the context of physical assistance versus those who received physical assistance alone (MDS recall = 1.26 ± 1.34 vs 1.48 ± 1.55, respectively).

There were significant differences between the 10 sites for this quality indicator, with the proportion of failures ranging from 0% to 100% ($\chi^2 = 25.37, p < .01$). The denominators (Table 1, column 9) for sites that scored 0% “fail,” or 100% “pass,” on this indicator (sites 2, 4, 5, and 6) ranged from only one to five participants. This indicator is more meaningful for facilities in which a larger number of participants who required physical assistance ate their meals in the dining room (sites 1 and 10). NH staff in site 4, for example, specifically reported that only residents who were completely independent were allowed to have their meals in the dining room.

**DISCUSSION**

The data presented in this study lead to two major conclusions. First, the observational protocol produced conclusions about the adequacy and quality of feeding assistance that we believe are clinically important and that are based on standardized observation and scoring rules that can be clearly understood and replicated by other quality assessment teams. In fact, given that one person can reliably observe six to eight residents during one mealtime period (i.e., approximately 45 to 60 minutes), it should be possible for both indigenous NH quality assurance staff and external survey team members to use the observational protocol effectively. Only one of the four quality indicators presented in this study was limited to assessment in the dining room (QI 4: presence of verbal assistance when physical assistance is provided). The observational protocol would provide survey team members with a rigorous and reproducible methodology for documenting problems with feeding assistance that could be applied equally to all NHs and, thus, reduce the motivation of NH staff to challenge survey outcomes.

The second major conclusion of this study is that all 10 facilities showed significant quality problems according to more than one of the four feeding assistance QIs. Despite the small sample sizes within each facility, there were statistically significant differences for three of the four QIs. The fact that pervasive problems were documented using the observational protocol speaks to one of the main concerns about observational methodologies: They are obtrusive and might potentially change the behavior of those being observed. Obtrusiveness must always be considered when collecting observational data, and this limitation supports arguments that quality assessment be conducted using multiple data sources (e.g., observation, interview, and chart review).

The observational procedures used in this study did, however, result in the documentation of specific problems with feeding assistance and oral intake data recording in all NHs, despite the possibility that the observations may have improved the targeted NH staff behaviors. Furthermore, the majority of mealtime observations were conducted during the breakfast and lunch meals. Recent evidence suggests that NH residents with dementia are more likely to consume a higher proportion of the breakfast meal as compared to the lunch and dinner meals (26). Nurse aide staff-to-resident ratios were also reported to be lower during the evening shift (i.e., dinner) for the NHs in this study (eight to 13 residents per aide). Thus, the proportion of residents who consume less than 50% and who receive inadequate staff assistance or poor quality assistance is likely to be even higher during dinner. The data and quality conclusions generated by the observational protocol, therefore, suggested conservative estimates of the need for improvement and unambiguous directions for improvement.

In conclusion, we have described a feeding assistance observational protocol that is feasible to implement by both internal and external quality assurance personnel. The protocol focuses on specific care processes that can be measured and controlled by NH staff, which makes it useful for improvement purposes. The protocol is not intended to comprehensively assess all issues relevant to nutritional care in the NH setting. While there are alternative approaches to conducting observation that are based on assessment principles from other fields (e.g., anthropology, psychology), the protocol used in this study provides one of the first clear examples of the application of basic behavioral assessment principles to evaluate one important area of NH quality.

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