Staffing Ratios in Nursing Homes

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Is there evidence for an “optimal” staffing ratio in nursing home settings and do staffing ratios have a meaningful relationship to measures of quality care in long term care? (Questions submitted by Paul Mulhausen, MD, Clinical Professor, General Internal Medicine, University of Iowa Carver College of Medicine, Iowa City Iowa) with response posted to the Portal of Geriatric Online Education [http://www.pogoe.org] on August 11, 2009.

The Phase II study conducted by Abt Associates, Inc. for the Centers for Medicare and Medicaid Services (CMS) in 2001 addressed the questions: “Is there some ratio of nurses to residents below which nursing home residents are at substantially increased risk of quality problems? Conversely, is there some ratio of nurses to residents above which no additional improvements in quality are observed?”1(p.4) The researchers were indeed able to define appropriate threshold levels—namely “between 2.4 - 2.8, 1.15 - 1.30, and 0.55 - 0.75 hrs/resident day for nurse aides, licensed staff (RNs and LPNs combined), and Registered Nurses, respectively,”2(p-5) depending on nursing home population. These numbers seem to indicate the upper threshold of staffing above which little benefit accrues from adding more staff: As quoted in the subsequent literature addressing this topic, however, these ratios are more often than not used synonymously with minimal levels below which patients are at much greater risk for suffering adverse events.

Studies conducted since the 2001 Abt/CMS study have tried to improve methodologies and to expand the universe of long term care populations studied. No radically different recommendations for staff ratios have emerged. What has emerged, however, is an emphasis on analyzing the greater whole which comprises nursing home care rather than focusing on the single variable of staff ratio. Factors such as organizational structure of long term care facilities, their staff mix, staff stability and consistency of care all play crucial parts in determining quality of care—which itself is a complex and difficult attribute to measure. The need for ongoing research and attention is stressed throughout the literature.

At the Federal Level:

There has been considerable ongoing debate in the literature regarding optimal staffing ratios in long term care facilities. Minimum staffing requirements are spelled out in the federal Nursing Home Reform Act (NHRA), as part of the Omnibus budget Reconciliation ACT (OBRA) of 1987. As summarized by Zhang et al., the Act:

- requires minimum staffing levels for registered nurses (RNs) and licensed practical nurses (LPNs), and a minimum educational training for nurse’s aides (NAs). The NHRA requires Medicare and Medicaid certified nursing homes to have: an RN director of nursing (DON); an RN on duty at least 8 hours a day; 7 days a week; a licensed nurse (RN or LPN) on duty the rest of the time; and a minimum of 75 hours of training for nurse’s aides. The law allows the DONs to also serve in the capacity as the RN on duty in facilities with less than 60 residents. In addition, the law requires nursing homes “to provide sufficient staff and services to attain or maintain the highest possible level of physical, mental, and psychosocial well-being of each resident” (Harrington, 2001; OBRA, 1987). Total licensed nursing requirements converted to hours per resident day (HPRD) in a facility with 100 residents are around 0.30 HPRD (Harrington & Millman, 2001), or 30 hours per day.3

It is generally agreed that these requirements are vague and insufficient. In 2000, Abt Associates Inc. conducted a Phase I study for the Centers for Medicare and Medicaid Services (CMS) which specifically examined the appropriateness of minimum nurse staffing ratios in nursing homes. Although the Phase I study found a definite relationship between staffing levels and quality of care, and did specify thresholds below which residents became at risk for harm, the study was generally found to be seriously flawed. The researchers apparently used data from only three states and that data was found to be inconsistent and inaccurate.3 A Phase II study was published in 2001 which was methodologically stronger. The researchers looked at data from 10 states and over 5,000 facilities. They divided quality measures by short and long term stays. For short term stays, they looked at hospital transfer for conditions that could have been avoided—such as UTIs, sepsis and electrolyte disorders; for long term stays of at least 90 days, they looked at functional improvement, incidence of pressure sores, skin trauma, resisting care improvement and weight loss.

Their findings were:

For each measure, there was a pattern of incremental benefits of increased nurse staffing until a threshold was reached at which point there were no further benefits with respect to quality when additional staff were utilized. Depending on the nursing home population, these thresholds range between 2.4 - 2.8, 1.15 - 1.30, and 0.55 - 0.75 hrs/resident day for nurse aides, licensed staff (RNs and LPNs combined), and Registered Nurses, respectively.

Although no quality improvements are observed for staffing levels above these thresholds, quality is improved with incremental increases in staffing up to these thresholds [authors’ emphasis].

Implementation of these thresholds as requirements would find 97 percent of all nursing homes failing to meet one or more of these standards [this writer’s emphasis]. The analysis also indicated that implementation of thresholds lower than those above which maximize quality, would still result in substantial improvements in a smaller, yet substantial portion of all nursing homes.3(p-5)

The bottom line, as recommended by the Abt study was that “a minimum of 4.1 HPRD [hours per resident day] was needed to prevent harm to residents with long stays (90 days or more) in
nursing homes."4(p.11) In addition to the Abt/CMS studies, the Institute of Medicine (IOM) issued two reports in 1996 and 2001 respectively. The 1996 report recommended 24 hour per day Registered Nurse care.

The 2001 report recommended a minimum federal standard of 24 hours per day of RN coverage and increased levels of total nurse staffing for all nursing homes, adjusted to take into account resident case mix. In 2003, the IOM issued a new report titled “Keeping Patients Safe.” IOM again advocated instituting minimum staffing levels in nursing homes based on the 2001 CMS report and recommended staffing requirements that ensure the presence of at least one RN on duty at all times and staffing levels that increase as the number of patients increases.4(p.12)

The IOM report did support the 4.1 total nursing HPRD recommendation suggested in the initial Abt/CMS report.

Prior to the Abt/CMS and the IOM reports, recommendations had also been published based on an expert panel which was convened at the John A. Hartford Institute for Geriatric Nursing, division of Nursing, at New York University in April 1998.5 In addition to the RN DON, the panel recommended a full-time assistant DON for nursing homes with more than 100 beds, at least one RN nursing supervisor on duty at all times, and one full-time RN director of in-service education in nursing homes with more than 100 beds. The experts recommended a ratio of 1 direct caregiver (including RNs, LPN/LVNs, and NAs) to 5 residents on the day shift, 1 to 10 for evenings, and 1 to 15 for nights (2.93 HPRD). Finally the panel recommended nurse staffing levels be adjusted upward for residents with higher nursing care needs. Overall, the experts recommended a minimum of 4.44 HPRD of total nursing time (excluding DON and assistant DON of .11 HPRD) (Harrington, Kovner et al., 2000).6(p.12)

Controversy over federal standards continues. Consensus may partially be hampered, as Harrington suggests by financial considerations. (“The debate over the federal standards has intensified and involves complex issues about funding new staffing requirements because government pays for 61% of total nursing facility costs in the United States (Levit, Smith, Cowan, Lazenby, & Martin, 2002).”4 (p.10) Another contributing complicating factor mentioned by many authors is the nursing shortage in the United States.1,4,5,6

At the State Level:

In addition to federal recommendations/requirements, almost all states have their own staffing regulations. These vary widely across states but in general the state recommendations specify lower ratios than the federal ones. Harrington has written two comprehensive summary articles addressing state recommendations which were published in the February and March 2005 issues of the Journal of Gerontological Nursing.4,7 The first article describes nurse staffing standards in all states and the District of Columbia. The second compares state minimum standards with actual staffing levels. For total nursing staff (RNs, LPNs, LVNs, and NAs) those state minimum standards range from a low of 1.02 hprd (DC) to 3.48 hprd (CA).

Comparing states’ minimum nursing standards is not an easy task. Tilly et al., for example, found, as did Charlene Harrington, that state ratios vary in how they are described and are difficult to compare across states. For example, ratios vary by facility size or type, personnel, and shift; some are expressed as ratios to residents or to beds while others are expressed in hours. We found inconsistencies in the reporting of state ratios among different sources that might be caused by this variation and complexity; alternatively, the inconsistencies by be due to the timing of the various studies.7

The difficulties found by Tilly et al. in comparing states’ existing minimum standards are just a fraction of those encountered by this writer in trying to interpret recent research addressing Dr. Mulhausen’s question, namely—is there evidence based research that would spell out an “optimal” staffing ratio for nursing home settings and the relationship staffing ratios have to measures of quality care.

What are we measuring, how do we measure it how do we know which is better?

Outlined below are some of the layers of complexity which exist:

1) The ratio itself. Three types are commonly referred to: hours per resident day (hprd); staff-to residents; and staff to beds.3 Hours per resident day seems to be the most widely used in the current literature. In large part this has evolved to avoid problems caused by wording such as that used in the OBRA requirements which makes no distinction between nursing homes with a small number of residents/beds and nursing homes with hundreds of residents/beds. Another ratio focused upon in the literature is the ratio of RNs to total staff.8

2) A second level of complexity arises in the use of the term staff. Some studies/recommendations/regulations lump together registered nurses (RNs), licensed vocational nurses (LVNs or LPNs), and nursing assistants (NAs), some maintain separate calculations for the three types of staff members, and yet others distinguish only between licensed nurses (RNs AND [ LPNs or LVNs]) and nursing assistants. (In fact, the OBRA requirements do not address the numbers or ratios of nursing assistants at all). 3) Many factors other than sheer numbers interact to play a crucial role in quality of care—and their importance can sometimes be underestimated by an overemphasis on numbers. These include: rates of staff turnover; staff stability; level of training and type of experience of staff; professional staff mix; use of agency (temporary staff); facility management and organizational structure— including whether the facility is privately owned, and/or accepts Medicaid as well as Medicare patients.3,8,10

4) Difficulties related to types and sizes of facility especially where short stay rehab services are offered in the same facility as long term residential care—together with the mix in patient acuity associated with each.

5) Measures of quality of care are many and extremely varied across studies. Some studies look at incidence of specific conditions and consider these representative of all potential deficiencies that might occur, for example at a state regulatory site visit. Others look at composite measures. Yet others look at...
positive measures or "processes of care" such as assisting residents out of bed, feeding assistance, facilitating residents’ social interaction. Examples of different quality measures, most of which are proxy measures, include:

a. incidence of pressure sores and urinary tract infections
b. better cognitive function

c. a combination of 14 quality indicators derived through "exploratory factor analysis" and looking at percentages of: pressure sores in both low and high risk patients in both short and long stay categories, urinary tract infections, increased need for help with ADLS, presence of moderate to severe pain in both short and long stay patients, physical restraint use, presence of depression or anxiety, catheterization with catheter left in bladder, spending most of time in bed or in a chair, decreased ability to move in/around room, and delirium

d. Weight loss

References


3. Tilly H, Black K, Ormond B, Harvell J. State Experiences with Minimum Nursing Home certification regulations. Sixteen care processes implemented by NAs and measured by direct observation and resident interview which are divided into "four major domains: out of bed/social engagement; feeding assistance; incontinence care; exercise as well as repositioning of the person."[p.238]


Conclusions and Recommendations?

Wrapping up, we seem to be left with the 2001 Abt/CMS recommendations for “4.1 mean total (nursing aides [NAs] plus licensed nurses) direct care hours per resident per day (hrpd) and 1.3 licensed nurse hprd (.75 for registered nurses [RNs] and .55 for licensed vocational nurses [LVNs] [as] the minimum staffing levels associated with a lower probability of poor resident outcomes, such as weight loss and pressure ulcers (Kramer and Fish 1001),” thresholds which were also supported in the 2001 IOM Report. These studies also “showed that 2.8 to 3.2 NA hprd, depending on the acuity level of the NH population, were necessary to consistently provide all of these daily care processes” [“care related to incontinence care, feeding assistance, exercise, and activities of daily living (ADL) independence enhancement (e.g., dressing)”.

The strength of the evidence supporting these specific recommendations is partial at best—given the complexity of variables summarized above.