

Recommendations

These recommendations take into consideration testimony originally coded to 18 (Staffing)¹, as well as other sources, as noted.

- U1. All stakeholders—health-care delivery organizations, professional schools, third-party payers and government health programs, purchasers, regulatory and licensing agencies, professional associations, labor unions and state legislators—should work together to ensure adequate availability of qualified health professionals.²
- U2. Health-care delivery organizations should address health-care workforce shortages without compromising patient safety. Specifically, they should:
 - o U2a. Match the quantity and qualifications (appropriate training, experience and level of alertness) of staff on duty to patient needs as identified by staff working in the patient care unit and in accordance with recommendations made by national advisory bodies, regulatory and accreditation rules, and legislative and contractual mandates.
 - o U2b. Acknowledge human limitations and the serious potential for harm caused by fatigue-related performance and an aging workforce and incorporate the findings of national advisory bodies related to overtime work precautions into their staffing plans.
 - o U2c. Create environments that support safe care by taking into account other human limitations,³ understanding the sources of job-related hazards, and implementing harm reduction programs as recommended by the National Institute for Occupational Safety and Health.
- U3. To accomplish these goals, the State of Michigan, in collaboration with the Michigan Partnership for Safe Health Care, should:
 - o U3a. Direct funds to schools that cannot afford to hire additional faculty required to produce shortage staff.
 - o U3b. Convene diverse groups of stakeholders to develop and implement novel solutions to reducing shortage staff turn-over and vacancy rates.
 - o U3c. Evaluate staffing effectiveness as it relates to harm at high levels of aggregation.
- U4. National consensus standards and measures should be used to monitor and evaluate the effectiveness of Michigan health-care organizations' staffing practices on patient safety, health, satisfaction, and access to care outcomes, as well as staff safety, satisfaction, and retention/turnover. As it relates to nursing, these standards should include those for nursing-sensitive care as defined by the National Quality Forum (NQF) and as stipulated by the American Nurses Credentialing Center (ANCC) for hospital-based magnet status.
- U5: Third-party payers and government-sponsored health-care programs should:
 - o U5a. Reward health-care delivery organizations that meet or exceed NQF standards for nursing-sensitive care including failure to rescue measures; maintain low vacancy and turnover rates among shortage health-care workers; and/or achieve ANCC magnet status.
 - o U5b. Develop new incentive programs and financial support for health-care organizations willing to serve as clinical training sites.

Rationale

Ensuring availability of health-care professionals, meeting patient needs, and ensuring staffing effectiveness are crucial elements of a health-care system that minimizes avoidable harm to patients.

With its 2004 publication, *Keeping Patients Safe: Transforming the Work Environment of Nurses*, the IOM made an important contribution to the scholarship on nursing work and patient safety and the critical role that nurses play in patient safety. The IOM's analyses and recommendations were used as a basis for most of this report's recommendations. The IOM identified four sources of threat to safety, which include unsafe workforce deployment and work and workspace design.⁴ The IOM cautioned that solutions to these threats must be implemented in simultaneous and bundled ways. Recommendations contained at the beginning of this report focus on the IOM's solutions related to maximizing workforce capability. Additionally, several major studies and reviews of the literature have demonstrated a strong association, if not a causal link, between nurse staffing levels, measures of patient safety and preventable adverse outcomes.⁵

A number of health-care disciplines are experiencing critical shortages and distribution problems. In fact, within 10 years substantial shortages of 25 different health-care occupations are expected.⁶ As a result, health-care organizations across the continuum of care are struggling to deliver safe care to patients. With inadequate staffing, undesirable patient health outcomes occur and staff dissatisfaction increases, further impairing efforts to retain sufficient staff; creating a vicious cycle. The problems are complex and the solutions require organized, multi-faceted initiatives across a broad array of Michigan stakeholders, including the State.

Although individual health-care organizations and schools can do much, state-level intervention must be part of the solution. The State in its various capacities—including as health-care payer, purchaser, and employer—is needed to champion efforts to improve the health-care workforce. In addition to its leadership role in improving the availability of qualified health professionals, the State should evaluate the effectiveness staffing practices. Several national advisory bodies have established the need for state and national-level databases to evaluate trends in nurse staffing as related to patient safety indicators at a high level of aggregation.

Evidence for harm reduction

It is self-evident that at some point, diminished access to sufficient levels of appropriately qualified health-care services will harm patients. A recent report examining health-care workforce issues in Michigan identified shortages for almost all health-care professional and technical occupations.⁷ Shortages are worse in rural areas. Some shortages are considered to pose very serious threats to the health and safety of Michigan residents. In particular, within 10 years, the shortage of registered nurses (RNs) is expected to grow from -2,292 to -17,945. Similarly, the shortage is expected to grow for pharmacists from -424 to -2,850, for pharmacy technicians from -1,240 to -4,590, for cardiovascular technologists and technicians from -348 to -1,259, for medical/clinical laboratory technologists from -721 to -2,789 and for emergency medical technicians and paramedics from -422 to -2,087.

The situation as it relates to current and future nurse staffing has been described by many as a crisis which threatens to worsen and undermine the quality and safety of the entire health-care system. A recent study found that 30 percent of RN survey respondents left their first RN position within the first year of employment and 57 percent left within the first two years.⁸ The respondents cited a number of concerns that caused them to leave their positions. "Inadequate staffing" was cited by 79 percent.

Numerous peer-reviewed studies, reviews of the literature and national advisory bodies have found a relationship between staffing and adverse events and errors suffered by patients. In

particular, a large national study conducted by Aiken et al. found that deaths declined as RN-to-patient staffing ratios declined. They found that staffing at a ratio of 1:4 (1 RN for each 4 patients) rather than 1:8 prevented five deaths per 1,000 admissions. In other words, requiring an RN to care for 8 patients rather than 4 results in a 31 percent higher risk-adjusted mortality rate. Based on these findings, improved nurse staffing would save 20,000 lives of the 4 million patients undergoing common surgical procedures. Based on 35 million admissions per year, 50,000 lives could be saved by improved staffing.⁹ Aiken states that there is far too little emphasis on what is widely agreed to be a primary safety problem—inadequate nurse staffing in hospitals, and unsafe and inefficient nurse practice environments.

Practice environments include hours of work. Overworked staff members become fatigued and are more likely to commit errors than are well-rested staff. The Institute of Medicine (IOM) evaluated the effect of prolonged work hours and fatigue in general and among nurses. A 2002 AHRQ-funded study conducted at the University of Pennsylvania found that errors and near-miss incidents increased when shifts exceeded 12 hours. When shifts exceeded 12 hours, errors were higher among nurses who were mandated to work overtime compared to those who voluntarily worked overtime. Additionally, taking a 30-minute break during a 12-hour shift did not decrease error risk.¹⁰

The evidence regarding the connection between fatigue among physicians and errors is mixed. For interns working in ICUs, working 30-hour shifts (80 hours per week) compared to 16-hour shifts (63 hours per week) resulted in 36 percent more serious errors including five times more serious diagnostic errors.¹¹ Retrospective surveys of otolaryngology surgical residents showed that, on average, residents were working 67.5 hours per week after duty hour restrictions were implemented. Opinions among residents were mixed as to whether reducing hours of work affected error rates.¹² In a time series analysis of New York surgical patient safety indicators, after implementing national resident work hour limits (no more than 80 hours per week and no work periods over 24 hours) there were no improvements in surgical patient safety indicators.¹³ One of the measures assessed was the rate of post-operative deep venous thrombosis. These rates went up during the study period, possibly showing the effect of reductions in nurse staffing. Not discussed in the article but nonetheless a reasonable concern is whether working 24-hour periods and 80 hours per week should be expected to lead to less harm to patients.

Unsafe environments can affect staff as well as patients. The Occupational Safety and Health Administration has identified threats to health-care worker safety which include workplace violence; biological, chemical, physical and psychological hazards; and drug exposures. Health-care organizations should be vigilant in monitoring these threats at high-risk times and in high-risk settings, such as patient admission and transfer, shift change and in the emergency department.¹⁴

Assessment

Advantages

- The Department of Community Health, Department of Labor and Economic Growth, and Public Policy Associates, Inc. have done an impressive amount of work on the topic of developing the Michigan health-care workforce. Their document contains a long list of strategies to reduce turnover and vacancies for all types of health-care occupations.¹⁵
- There is an opportunity to increase the nursing workforce by building on established national programs (e.g., one sponsored by Johnson and Johnson) that aim to retain current nurses in practice and increase the capacity of nursing education programs.¹⁶
- Recommendations related to staffing practices are consistent with those promulgated by respected national organizations such as the IOM, NQF, ANCC and others.

- Newly established nationally standardized performance measures can be used by health-care organizations to assess the extent to which nursing personnel in acute care hospitals contribute to health-care quality and safety. Data arising from use of the NQF standards can be used by:
 - o Consumers to assess nursing quality.
 - o Providers to identify clinical issues in need of improvements and staffing practices that reduce errors and other avoidable injury to patients.
 - o Purchasers to reward hospitals that have higher performing nursing services.
- State-level staffing benchmarks could be provided to health-care organizations so they may make adjustments if needed.
- Analyses conducted on behalf of the Michigan Nurses Association suggest that there is evidence to support a “business case” for reducing nurse-to-patient ratios and eliminating mandatory overtime.¹⁷
- Incentive programs that reward health-care organizations for improving safety are already in place at Blue Cross Blue Shield of Michigan. This program could be expanded to include workforce and safety concerns and serve as a template for other payers.

Barriers

- There are limits to how many RNs can be educated and deployed in the near term and successful implementation of the remainder of the recommendations hinges on being able to procure sufficient staff.
- The current payment system does not appropriately reward hospitals and other health-care organizations that provide nurse staffing at optimal levels. These financial disincentives are unlikely to change in the near term.¹⁸
- Distrust among various sectors of the health-care industry may impede efforts to collaborate.

Implementation

Further research

- Investigations on the effect of variations in staffing practices on patient safety, health, satisfaction, and access to care outcomes, as well as staff safety, satisfaction, and retention/turnover are desperately needed.
- Likewise, research to establish specific minimum nurse-to-patient ratios in all patient care areas is needed.¹⁹

Legislation

No changes to Michigan law are proposed.

Resources

- Fund additional faculty positions within schools of nursing and for clinical faculty mentors within health-care delivery organizations that serve as clinical learning sites.
- In critical need areas, fund nurse trainee scholarships and tuition reimbursement programs.
- Private and public foundations should fund research that identifies the effects of staffing patterns on patient and staff safety and other outcomes.
- Continue to fund nursing home wage pass-through provisions.

Incentives

Recommended incentives are incorporated into the recommendations.

Specific steps and target dates

Following adoption of these recommendations, the following steps will take place:

- Within six months, the Partnership will convene a task force of stakeholder groups charged with developing and cooperatively implementing a plan to ensure access to all shortage health-care professionals.
 - Include the Health Care Workforce Development in Michigan Advisory Roundtable.
 - Use information and suggestions contained in the following reports: *Health Care Workforce Development in Michigan* and *Health Care Wisconsin*.²⁰
 - Emphasize access to critical shortage occupations, especially RNs, found to be serious threats to Michigan residents.
 - Develop and implement strategies to return inactive critical staff to practice, retain existing staff by addressing unsafe and unsatisfactory working conditions, and produce new staff through novel approaches to partnering with training/teaching health-care organizations.
- Within 12 months, the Partnership will assist health-care organizations to collect, manage and analyze statewide staffing effectiveness data.

Testimony overview

Summary

Testimony on the topic of issues related to the health-care workforce focused almost exclusively on nursing. Testimony was submitted by 20 informants representing hospitals (1), providers not speaking on behalf of an organization (6), educators (2), consumers and labor organizations (7), insurers (1), professional societies (2), and a non-profit organization (1).

Key findings

With respect to ensuring an adequate availability of health-care professionals, a number of informants voiced concerns about a shortage of RNs²¹ and made the follow specific recommendations:

- [Stop] turning away qualified nursing school applicants because of faculty and clinical area shortages.²²
- Reducing vacancy rates through strategic partnerships such as that between Munson Medical Center and Northwestern Michigan College whose vacancy rate is 2 percent or less.²³
- Use of “Volunteer RN Corps” to encourage licensed RNs willing to perform clinical care to re-enter the workforce.²⁴
- The need for funding nursing schools and in some cases, scholarships.²⁵
- The need to address workforce retention problems,²⁶ nurse turnover and vacancy rates,²⁷ and nurse faculty shortages.²⁸
- The need to fund nurse education programs.²⁹

- Forming novel partnerships.³⁰

Regarding the issue of meeting patient needs, numerous informants voiced concerns about how nurse staffing levels are determined and achieved.³¹ Informants recommended:

- Elimination of mandatory overtime as a staffing strategy.³²
- Adopting baseline minimum nurse-to-patient ratios as a staffing strategy.³³
- Use of valid measures of patient acuity to determine nurse staffing levels.³⁴
- Use of appropriate staffing plans.³⁵
- Use of unit-based staffing committees that involve bedside nurses.³⁶
- Clear definitions regarding which staff are counted as nursing personnel in staffing decisions.³⁷
- Being cautious regarding use of traveling nurses.³⁸
- Accurately monitor staffing levels.³⁹
- Use of self-staffing models.⁴⁰

Other recommendations made by informants include the following:

- As a means to improving work conditions and retention, create incentives for hospitals to achieve magnet status.⁴¹

Research overview

Ensuring availability of health-care professionals

The issues related to the causes and solutions to the nursing shortage are complex and provide an unsettling backdrop for all other efforts to improve the working conditions of nurses and the safety of patient care. The shortage is persistent, growing, and contributes to health-care errors. By 2020, it is estimated that the gap in the U.S. between supply and demand will be between 400,000 and 800,000 nurses.⁴² Michigan is estimated to be short 18,000 nurses by 2020.⁴³

Increasing the availability of qualified nurses is important because perceptions about the shortage and current working conditions affect nurse satisfaction and retention rates,⁴⁴ thus worsening the shortage.

The Michigan Health & Hospital Association has recognized that the supply of nurses is jeopardized by nursing faculty shortages and has indicated that additional funds are needed to hire nurse faculty and educate nursing students.⁴⁵ While the Michigan Nursing Scholarship Act of 2002 (PA 591, MCL 390.1181 to 390.1189) established a Michigan Nurse Professional Fund, this fund is not focused in ways that address a key cause of the current shortage: lack of faculty.

A recent Detroit News article was critical of the state's universities for failure to plan for needed faculty and suggested that more affiliations were needed between practicing clinical faculty and academic institutions.⁴⁶ A number of other publications have identified and reviewed the reasons for and dimensions of the nursing workforce shortage.⁴⁷

Meeting patient needs

With respect to staffing in general, the Joint Commission on Accreditation of Healthcare Organizations⁴⁸ and the Michigan Public Health Code lay out nurse staffing requirements for hospitals and nursing homes.⁴⁹ Despite existing regulations, the Commission received testimony detailing a number of safety concerns related to insufficient and unqualified staff on duty to meet patient needs.

Several methods to address these safety concerns were suggested. The first involves specific nurse-to-patient staffing ratios. Although use of specific ratios were not supported during the Review Panel's Round One deliberations, it is important to understand what is happening federally and in other states.

In 1999, California enacted legislation that went into effect in 2004 mandating minimum nurse-to-patient staffing ratios in all patient care units and in all hospitals. Since 2004, legislation mandating minimum nurse-to-patient ratios has been introduced in Michigan, Hawaii, Iowa, Missouri, Tennessee, Connecticut, Maine, Illinois, Massachusetts, New York, Pennsylvania, and Rhode Island.⁵⁰ Additionally, similar legislation was introduced in Oregon, Nevada, Montana, Kentucky, Ohio, West Virginia, Virginia, Florida, New Jersey, Maine, and Vermont.⁵¹

Bills mandating direct care RN-to-patient staffing ratio requirements for hospitals have been introduced in the Michigan House (H. B. 4101) and Senate (S. B. 169). In the U.S. House of Representatives, H.R. 1222—the Nurse Staffing Standards for Patient Safety and Quality Care Act of 2005—was introduced in March, co-sponsored by Rep. John Conyers (D-MI). The Michigan bills also require use of staffing plans and patient acuity to determine staffing requirements and prohibit use of mandatory overtime to meet staffing requirements.

There is agreement within the peer-reviewed literature and among some of the nation's most respected advisory bodies that, in general, current efforts to ensure that patient needs are met are inadequate and changes as noted in the recommendation are needed.

- The National Quality Forum concluded that a relationship between nurse staffing and adverse events exists and based on adverse event rates, health-care organizations that attracted and retained more skilled nurses per patient were safer institutions. The NQF recommended that health-care organizations, “Specify an explicit protocol to be used to ensure an adequate level of nursing based on the institution’s usual patient mix and the experience and training of its nursing staff.”⁵²
- A review of 43 articles on nurse staffing and patient, nurse and hospital outcomes found that total nursing hours and skill mix affect patient outcomes. The investigators recommended that patient acuity, skill mix, nurse competence, nursing process variables, technological sophistication, and institutional support of nursing be considered when setting staffing requirements.⁵³
- The IOM recommended that hospitals and nursing homes use the following practices to determine nurse staffing for each patient care unit per shift (Recommendation 5-2).⁵⁴
 - o Incorporate estimates of patient volume that count admissions, discharges, and “less than full-day” patients in addition to a census of patients at a point in time.
 - o Involve direct-care nursing staff in determining and evaluating the approaches used to determine appropriate unit staffing levels for each shift.
 - o Provide for staffing “elasticity” or “slack” within each shift’s scheduling to accommodate unpredicted variations in patient volume and acuity and resulting workload. Methods used to provide slack should give preference to scheduling excess staff and creating cross-trained float pools with the health-care organization. Use of nurses from external agencies should be avoided.
 - o Empower nursing unit staff to regulate unit work flow and set criteria for unit closures to new admissions and transfers as nursing workload and staffing necessitate.
 - o Involve direct-care nursing staff identifying the causes of nursing staff turnover and in developing methods to improve nursing staff retention.
- Similarly, for certification as a magnet hospital, the American Nurses Credentialing Center requires hospitals to have a staffing system that:

- o Adapts and flexes to internal and external factors such as staff illness and unanticipated shifts in workload.
- o Incorporates patient needs, staff member skill sets, and staff mix.
- o Directly involves nurses in a variety of decentralized, shared decision-making processes.

Fatigue

There is disagreement among experts on the effects of fatigue and use of maximum work hours per day to prevent fatigue-related harm. Clearly there is a point beyond which health-care staff should not work because of the increased likelihood that errors will be made that harm patients.

The IOM studied fatigue-related error among nurses and found that shifts exceeding 12 consecutive hours increased error and near-miss rates. They also found that training, motivation, or professionalism can overcome performance deficits associated with fatigue, sleep loss, and circadian-related sleepiness. To that end, the IOM made the following recommendation (Recommendation 6-1).⁵⁵

- State regulatory bodies should prohibit nursing staff from providing patient care in any combination of scheduled shifts, mandatory overtime, or voluntary overtime in excess of 12 hours in any given 24-hour period and in excess of 60 hours per 7-day period.
- Health-care organizations and labor organizations representing nursing staff should establish policies and practices designed to prevent nurses from working longer than 12 hours in a 24-hour period and in excess of 60 hours per 7-day period.
- Schools of nursing, state boards of nursing, and health-care organizations should educate nurses about the threats to patient safety caused by fatigue.

The Michigan Health & Hospital Association views mandatory overtime as an unavoidable situation that is not the preference of either the employer or employee and is a symptom of the severe statewide nursing shortage. They argue that employers are forced to require staff to work additional hours because of “unexpected high occupancy levels due to illness outbreaks and accidents, unanticipated staff absences due to personal or family emergencies, unusually high patient acuity levels, weather-related problems, and other unanticipated disasters and emergencies.”⁵⁶

States that have passed legislation prohibiting various aspects of mandatory overtime include: Oregon, California, Minnesota, Texas, West Virginia, Maryland, New Jersey, Maine, Connecticut, and Rhode Island.⁵⁷ As mentioned earlier, Michigan and the U.S. Congress have introduced bills prohibiting use of mandatory overtime as a way to meet staffing requirements.

Evaluating Staffing Effectiveness

Many respected organizations are demanding assessment of staffing effectiveness.

- JCAHO accreditation requires health-care organizations to assess staffing effectiveness.
- The American Nurses Credentialing Center requires magnet hospitals to evaluate nurse satisfaction and ongoing monitoring, evaluation, and improvement of nurse-sensitive outcomes.
- The IOM has called for national and other databases to contain information about nurse staffing and the outcomes produced by various staffing levels and configurations. It also recommended that hospitals and nursing homes perform ongoing evaluation of the effectiveness of their nurse staffing practices with respect to patient safety. Some patient safety events are rare and would be more likely to be detected in a larger database.

- A set of 15 staffing effectiveness consensus standards are contained in the *National Voluntary Consensus Standards for Nursing-Sensitive Care: An Initial Performance Measure Set* released by the NQF in 2004.⁵⁸ NQF measures capture patient-centered outcome measures, nursing-centered intervention measures, and system-centered measures (includes skill mix, nursing care hours per patient day, practice environment scale, and voluntary turnover).

Review Panel Round One

Scoring summary

In Round One, the Review Panel was asked to score each recommendation area on a scale of 1 to 5, where 5=extremely viable, 4=very viable, 3=somewhat viable, 2=potentially viable with changes, and 1=not viable for this project. Average score for the relevant recommendation considered in Round One:

- Staffing: 3.75 (range 2 to 5)

Notes

There was strong support for addressing issues that face the nursing profession, but the Panel supported broadening the recommendation to include other health professions. In response to these requests, the scope of the recommendation has been broadened to address the larger health-care workforce. It should be noted, however, that there were few, if any, testimonies that cited lack of staff in non-nursing fields as a safety issue.

Regarding the availability of RN care, there was support for increasing the number of faculty in schools of nursing. The recommendation was modified to emphasize the need for nursing faculty.

The testimony contained numerous recommendations citing use of mandatory overtime as a source of harm to patients. There was some concern among panel members regarding the use of a maximum number of hours nurses could work as a way to prevent fatigue-related errors. This report clarifies that the recommendations are based on literature in this area.

Regarding the use of staffing ratios there was support for the use of staffing ratios in the written comments but verbal disagreement among panelists during meeting.

Other comments by panelists demonstrate support for nurse staffing methods that emphasize appropriate use of staff that recognizes differences in expertise and skills. One panelist commented on the causes of turnover and nurse dissatisfaction (empirical evidence on this topic was provided).

Endnotes

¹ Code 18 (Staffing) was used to identify testimony recommending use of staffing methods that acknowledge human limitations as part of an organization's patient safety system.

² Although the testimony received primarily addressed a lack of availability of licensed Registered Nurses, there are health-care staff shortages in many other fields including medicine (especially critical care intensivists, hospitalists, and office-based anesthesiologists), pharmacists and pharmacy technicians, therapists, lab technologists and imaging technicians. See study conducted by Public Policy Associates, Inc. (2004). *Health Care Workforce Development in Michigan, Final Report*.

³ See also recommendations to Design for Safety (Code T).

⁴ Institute of Medicine, Committee on the Work Environment for Nurses and Patient Safety. (2004). *Keeping Patients Safe: Transforming the Work Environment of Nurses*, Washington, DC: The National Academies Press.

- ⁵ Stanton MW, Rutherford MK. (2004). Hospital nurse staffing and quality of care. *Research in Action Issue 14*. AHRQ Pub. No. 04-0029. Rockville, MD: Agency for Healthcare Research and Quality; Lang TA, Hodge M, Olson V, Romano PS, Kravitz RL. (2004). Nurse-Patient Ratios, *Journal of Nursing Administration* 34:326-337. Institute of Medicine, Committee on the Work Environment for Nurses and Patient Safety. (2004). *Keeping Patients Safe: Transforming the Work Environment of Nurses*, Washington, DC: The National Academies Press.
- ⁶ Shortage occupations include RNs, pharmacists and pharmacy technicians, occupational therapists, physician therapists dentists, optometrists, radiation therapists, respiratory therapists and technicians, cardiovascular technologists, dental hygienists and assistants, medical and clinical laboratory technicians and technologists, sonographers, EMT and paramedics, nuclear medicine technologists, radiological technologists and technicians, medical records and health information technologists, licensed practical nurses, and medical assistants.
- ⁷ Public Policy Associates, Inc. (2004a). Health Care Workforce Development in Michigan, Final Report.
- ⁸ Bowles C & Candela L. (2005). First job experiences of recent RN graduates, *Journal of Nursing Administration* 35(3):130-137.
- ⁹ Aiken L. (2005). The unfinished patient safety agenda. *Morbidity and Mortality Rounds on the Web*, AHRQ. Retrieved 7.26.05 at <http://webmm.ahrq.gov/printviewperspective.aspx?perspectiveID=7>
- ¹⁰ Rogers AE, Hwang WT, Scott LD. (2004). The effects of work breaks on staff nurse performance. *J Nurs Adm.*, 34:512-519.
- ¹¹ Landrigan CP, Rothschild JM, Cronin JW, Kaushal R, Burdick E, Katz JT, Lilly CM, Stone PH, Lockley SW, Bates DW, Czeisler CA. (2004). Effect of reducing interns' work hours on serious medical errors in intensive care units. *N Engl J Med*.351:1838-48.
- ¹² Reiter ER, Wong DR. (2005). Impact of duty hour limits on resident training in otolaryngology. *Laryngoscope*, 115:773-9.
- ¹³ Poulouse BK, Ray WA, Arbogast PG, Needleman J, Buerhaus PI, Griffin MR, Abumrad NN, Beauchamp RD, Holzman MD. (2005). Resident work hour limits and patient safety. *Annals of Surgery*, 241:847-60.
- ¹⁴ Workplace Violence, Department of Labor, Occupational Safety and Health Administration, retrieved 7.30.05 at <http://www.osha.gov/SLTC/workplaceviolence/index.html>. Health Care Workers, National Institute for Occupational Safety and Health, retrieved 7.30.05 at <http://www.cdc.gov/niosh/topics/healthcare> .
- ¹⁵ Public Policy Associates (2004a), op cit.
- ¹⁶ Buerhaus PI. (2005). Six-part series on the state of the RN workforce in the United States. *Nursing Economics* 23(2):58-60 retrieved 5.3.05 at www.medscape.com/viewarticle/502804
- ¹⁷ Public Policy Associates, Inc. (2004b). *The Model Case for Reducing Patient-to-Nurse Staffing Ratios in Michigan Hospitals: Two Scenarios*. Lansing, MI: Public Policy Associates, Inc and Public Policy Associates, Inc. (2004c). *The Business Case for Reducing Patient-to-Nurse Staffing Ratios and Eliminating Mandatory Overtime for Nurses*. Lansing, MI: Public Policy Associates, Inc
- ¹⁸ Spetz J. (2005). Public policy and nurse staffing. *Journal of Nursing Administration* 35:14-16.
- ¹⁹ National Quality Forum. (August 2003). *Safe Practices for Better Healthcare: A Consensus Report*. Washington, DC: National Quality Forum.
- ²⁰ Public Policy Associates, Inc. (2004a) op cit. Governor's Health care Worker Shortage Committee. (2002). *Health Care Wisconsin: A Collaborative Agenda for Solving Wisconsin's Health Care Worker Shortage and Securing Delivery of High Quality Health Care for Wisconsin's Citizens*.
- ²¹ Testimonies 204B, 206O, 303O, 408O and 411W.
- ²² Testimony 206O:92-100.
- ²³ Testimony 105O:251-258, 282-331, 182-205; 105W:182, 188-189, 100-111.
- ²⁴ Testimony 303O:126-128, 132.
- ²⁵ Buerhaus PI, op cit.
- ²⁶ Testimony 904B.
- ²⁷ Testimonies 105B and 408O.
- ²⁸ Testimony 206O.
- ²⁹ Testimony 105B.
- ³⁰ Testimony 105B.
- ³¹ Testimonies 203O:124-126, 209O:34-37, 830W:34.
- ³² Testimonies 203O, 301O, 419W and 803B.
- ³³ Testimonies 305W:44-48; 105O:458-478; 402W:92-94; 404W:47-50; 410O:81-83; 411W:5-8; 416W:12-13; 210O:83-87; 419W:125-132; 171-183; 803B:P5, L38-41.
- ³⁴ Testimonies 419W and 803B.

- ³⁵ Testimonies 419W and 803B.
- ³⁶ Testimonies 105B, 303O, and 419W.
- ³⁷ Testimony 411W.
- ³⁸ Testimony 404B.
- ³⁹ Testimony 404B.
- ⁴⁰ Testimony 416W.
- ⁴¹ Testimony 105B:XX; 305W:161-163.
- ⁴² Buerhaus PI. (2005). Six-part series on the state of the RN workforce in the United States. *Nursing Economics* 23(2):58-60. www.medscape.com/viewarticle/502804 Accessed 5/3/2005
- ⁴³ Michigan Health & Hospital Association. May 25, 2004. *Talking Points: Legislatively Mandated Nurse-Patient Staffing Ratios*.
- ⁴⁴ Bowles C & Candela L. (2005). First job experiences of recent RN graduates, *Journal of Nursing Administration* 35(3):130-137.
- ⁴⁵ Michigan Health & Hospital Association. May 25, 2004. *Talking Points: Legislatively Mandated Nurse-Patient Staffing Ratios*.
- ⁴⁶ The Detroit News, *State Must Respond to Nursing Shortage: Good-paying jobs go unfilled because schools failed to anticipate future opportunities*, May 10, 2005, <http://www.detnews.com/2005/editorial/0505/10/A10-176407.htm> accessed May 23, 2005.
- ⁴⁷ Buerhaus PI. (2005). Six-part series on the state of the RN workforce in the United States. *Nursing Economics* 23(2):58-60. www.medscape.com/viewarticle/502804 Accessed 5/3/2005.
- ⁴⁸ JCAHO requires that “a system be used for determining adequate staffing”
- ⁴⁹ Michigan Public Health Code 333.20141(3) and 333.21720a.
- ⁵⁰ American Nurses Association. 2004 Legislation: Staffing Plans and Ratios (Updated 12/04). www.nursingworld.org/gova/state/2004/staffing.htm (Accessed 5/21/05).
- ⁵¹ The Advisory Board. (2004). *State Regulation of Nurse-to-Patient Ratios: Learning from California’s Experience*. Nursing Executive Center, Issue Brief. The Advisory Board Company.
- ⁵² National Quality Forum. (August 2003). *Safe Practices for Better Healthcare: A Consensus Report*. Washington, DC: National Quality Forum.
- ⁵³ Lang TA, Hodge M, Olson V, Romano PS, Kravitz RL. (2004). Nurse-Patient Ratios, *Journal of Nursing Administration* 34(7/8):326-337.
- ⁵⁴ Institute of Medicine, Committee on the Work Environment for Nurses and Patient Safety. (2004). *Keeping Patients Safe: Transforming the Work Environment of Nurses*, Washington, DC: The National Academies Press.
- ⁵⁵ Institute of Medicine, Committee on the Work Environment for Nurses and Patient Safety. (2004). *Keeping Patients Safe: Transforming the Work Environment of Nurses*, Washington, DC: The National Academies Press.
- ⁵⁶ MHA *Policy Brief*. May 2004. Mandatory Overtime Prohibition Legislation.
- ⁵⁷ American Nurses Association. 2004 Legislation: Staffing Plans and Ratios (Updated 12/04). www.nursingworld.org/gova/state/2004/staffing.htm (Accessed 5/21/05).
- ⁵⁸ National Quality Forum. (2004). *National Voluntary Consensus Standards for Nursing-Sensitive Care: An Initial Performance Measure Set*. Washington, DC: National Quality Forum (www.qualityforum.org).