

# The Community Hospital and its Healthcare Workforce: A *Societal* Case for Keeping the (Older, Night shift) Working Nurse Fit

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# Outline

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# Background

- The U.S. population is aging (He et al., 2005) and adding weight (Ogden et al., 2007).
- So too working adults: 2-in-3 adults are now overweight or obese and thus at elevated risk for diseases/conditions including coronary heart disease, hypertension, dyslipidemia, and diabetes (NHLBI 1998, 2000; Malik et al., 2004) known in the workplace to decrease productivity, increase absenteeism, and raise premiums cost (Schulte et al., 2007; Schmier et al., 2006; Goetzel et al., 2005).
- In no industrial sector is useful, disseminable knowledge on employee weight-related health risk factor reduction best practice more needed than in the hard-pressed Health Care and Social Assistance (NAICS-HCSA) sector where, in 2006, 3-of-14 industries with >100,000 nonfatal occupational injury and illness cases were found and general medical and surgical, i.e. community, hospitals led (264,300 cases) (NIOSH, 2008).

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# Background

- Concurrent aging of the population and health care labor force means that for the former to receive quality health care, the latter must remain physically and mentally fit for work (IOM, 2008).
- The hospital, and its functionally dominant component, the community hospital, anchors the HCSA.
- The American Hospital Association (AHA, 2008) defines community hospitals “as all nonfederal, short-term general, and other special hospitals[, which] include obstetrics and gynecology; eye, ear, nose, and throat; rehabilitation; orthopedic; and other individually described specialty services. Community hospitals include academic medical centers or other teaching hospitals if they are nonfederal short-term hospitals.”

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# Background

- ❑ Of total hospitals (n=5,708) that meet AHA registration criteria (without necessarily having registered), 86% (4,897) were community hospitals and, of these, 59% (2,900) were urban and 41% (1,997) rural and 59% (2,913) were non-government not-for-profit, 23% (1,111) state and local government operated, 18% (873) investor-owned (for-profit).
  - ❑ Of total staffed hospital beds (n=945,199), 85% (800,892) were located at community hospitals.
  - ❑ Of total hospital admissions (n=37,120,387), 95% (35,345,986) were to community hospitals.
  - ❑ Of total hospital expenses (\$641,123,636,000), 91% (\$583,252,288,000) fell to community hospitals (AHA, 2008).
  - Community hospitals, above all the not-for-profits, face mounting challenges including reduced operating margins, loss of well-compensated services and well-insured patients, workforce issues, and technology explosion (Choudhry et al., 2005; Zelenock, Zambricki, 2001; Hayden, 2005).
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# U.S. Workforce

- The graying of the U.S. workforce is just beginning. The labor force participation rate (LFPR) dipped from 67.1% in the late 1990s to 66.0% by 2004-05, declining for all major age-sex groups except age 55+ where a dramatic increase has been observed since 1995: in 60 months from March 2001, LFPR for these workers rose fully 4.7% (Mosisa, Hipple 2006).
  - Older workers are likewise more female: in 30 years from 1977, while the number of workers age 65+ rose 101% (compared to 59% for all workers age 16+), men rose 75%, women 147%. The increase does not reflect baby-boomer aging, however, since in 2007 the generation born 1946-64 had not yet reached age 65.
  - And the graying will continue: while the total workforce is projected to increase 8.5% in the period 2006-2016, the number age 16-24 is expected to decline, age 25-54 to rise only slightly, age 55-64 to climb by 36.5%, and age 65+ to soar by more than 80%.
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# HCSA Workforce

- The graying of the HCSA sector workforce is just beginning as well: in 2006 the average age of nurses, for example, was 45.2 years and climbing at more than twice the rate of all other U.S. occupations (BLS, 2008, 2009).
  - The HCSA sector represents over 12% of all employment, 8% of all establishments. In 2006 the HCSA employed over 17.8 million workers, with most (82%) working in health care. HCSA growth through 2016 is projected at more than 25% (adding four million new jobs). In this ten-year period, HCSA occupations are projected to account for half of the 20 fastest growing.
  - The HCSA includes three health care sub-sectors—ambulatory healthcare services (NAICS 621), hospitals (NAICS 622), nursing and residential care facilities (NAICS 623).
  - Over 81% of HCSA establishments are in health care; of these, 77% are physician, dentist, and other health practitioner offices.
  - While hospitals account for just one percent of health care establishments, they employ 35% of all health care workers.
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# HCSA Workforce

- Demand for HCSA, and particularly hospital, services increases exponentially with a hurricane, flood, tornado, or terrorist event.
- Public financing (Medicare and Medicaid) is critical to the HCSA hospital sub-sector, as is the imperative to provide charity care to those without other means. Under-reimbursement results in cost shifting to other payers, but because this recovery mechanism is limited tight funding is the rule.
- The HCSA is changing rapidly due to pressure to contain costs but also to keep up with rapid technological and clinical advances in disease and injury diagnostics and treatment.
- A high proportion of health care workers is found among the 15 million Americans who work evening, night, rotating shifts, and other irregular schedules. Working hours in the U.S. exceed Japan and most of W. Europe. Both shift work and long work hours have been associated with health and safety risks (NIOSH, 2008).

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# HCSA Workforce

HCSA Workforce issues include

- difficulties recruiting and retaining qualified worker;
- inadequate and chronic under-staffing, which exerts added mental and physical stress on providers;
- occupational health risks posed by increasing demand for services;
- shift work and long work hours (including mandatory overtime), which measurably impact the safety and health of workers and the quality of care for patients;
- reduction in hospital length of stay, which results in increased patient acuity and complexity of care and places increased demands on workers;
- and importation of health care providers, including nurses, which creates language and cultural differences and can impede training efforts and understanding of occupational safety and health requirements.

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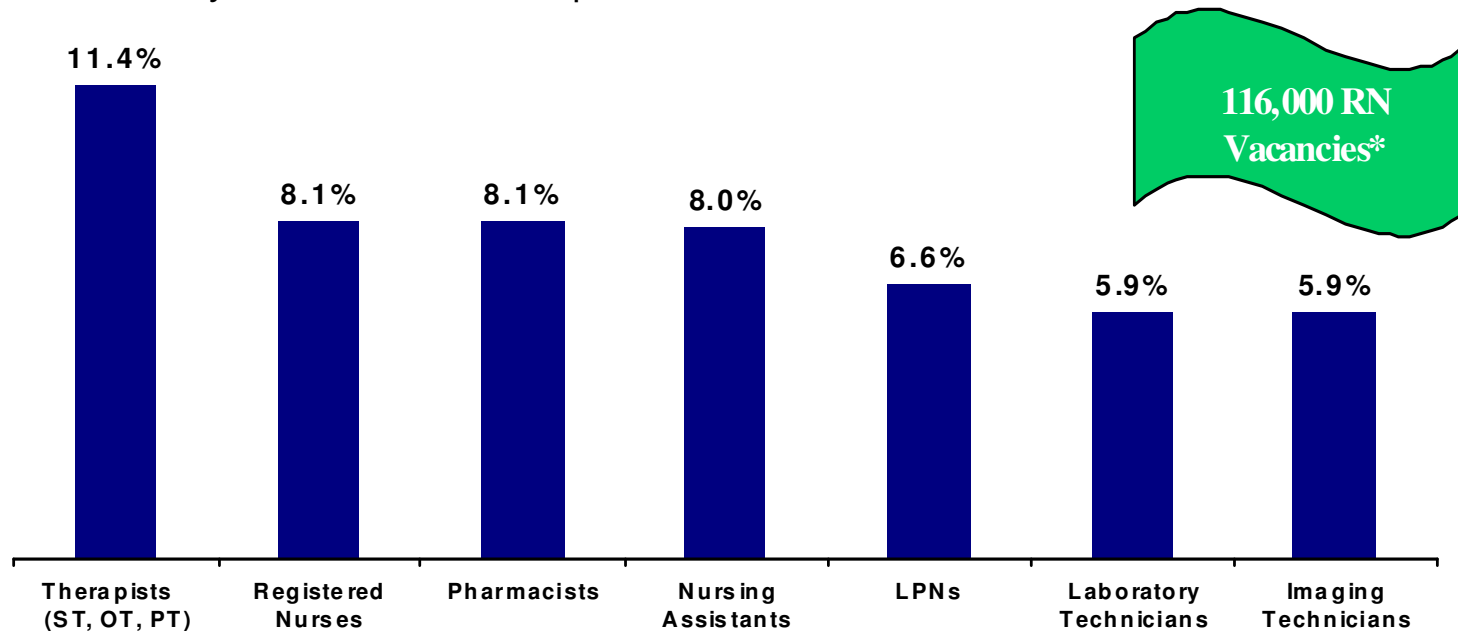
# HCSA Health Care Workforce

- Demand for health care workers is outstripping supply, causing shortage.
- According to the IOM, “In 2011 the first baby boomers will turn 65 ... The aging of the baby boom population, combined with an increase in life expectancy and a decrease in the relative number of younger persons, will create a situation where older adults make up a much larger percentage of the U.S. population than has ever before been the case. Between 2005 and 2030 the number of adults aged 65 and older will almost double, from 37 million to over 70 million, accounting for an increase from 12% of the U.S. population to almost 20% ... little has been done to prepare the health care workforce for its arrival. Older Americans use considerably more health care services than younger Americans and their health care needs are often complex ... The education and training of the entire health care workforce with respect to the range of needs of older adults remains woefully inadequate ... *To address major shortages, steps need to be taken immediately to increase overall workforce numbers and to use every worker efficiently....*” (IOM 2008, p. 1, emphasis added).

# HCSA Health Care Workforce

- Shortage cases in point include inadequate nurse, pharmacist, therapist, lab tech, imaging tech supply (AHA, 2007).

**Table 1.** Vacancy Rates for Selected Hospital Personnel, December 2006



Source: 2007 AHA Survey of Hospital Leaders. Note: 116,000 vacancies is a national estimate created by extrapolating the vacancy rate to all 5,000 community hospitals in 2005. ST: Speech Therapist, OT: Occupational Therapist, PT: Physical Therapist.

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# HCSA Nurse Workforce

- The shortage of nurses results, supply side, from fewer people entering and staying in nursing, demand side, from increasing need for health services as the population ages, added to which, by 2010, 40% of nurses themselves will be over 50 years of age (USGAO, 2001; HRSA, 2005).
- The figures are alarming (AANC, 2009):
  - ❑ shortage of RNs could reach 500,000 by 2025 while demand is expected to grow by 2% to 3% each year (Buerhaus et al., 2008);
  - ❑ to meet healthcare needs, 30,000 more nurses should be graduated annually, 30% over the current number of annual nurse graduates (CPNS, 2008);
  - ❑ over one million new and replacement nurses will be needed by 2016 to cope with the 587,000 new nursing positions that will be created through 2016 (a 23.5% increase), making nursing the nation's fastest growing profession (Dohm, Shniper, 2007);

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# HCSA Nurse Workforce

- The figures ... (AANC, 2009) (cont.):
    - ❑ hospitals currently need 116,000 RNs to fill vacant positions nationwide, which translates to a national vacancy rate of 8.1%, and 44% of hospital CEOs had more difficulty recruiting RNs in 2006 than in 2005 (AHA, 2007);
    - ❑ from the “Aging Workforce Survey” of nurses, fully 55% of surveyed nurses, the majority of whom nurse managers, reported the intention to retire between 2011 and 2020 (Hader et al., 2006);
    - ❑ the nation's nursing shortage is projected to grow to more than one million nurses by the year 2020 and all 50 states will experience a shortage of nurses to varying degrees by 2015 (HRSA, 2006);
    - ❑ despite the increase in employment of nearly 185,000 hospital RNs since 2001, there is no evidence that the nursing shortage has ended: national surveys conducted in 2004 found that a clear majority of RNs (82%) and physicians (81%) perceived shortages where they worked (Buerhaus et al., 2004).
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# HCSA Nurse Workforce

- The costs of nurse scarcity and attrition are considerable and include (Hatcher et al., 2006) replacement cost and patient outcomes cost.
- Replacement cost:
  - ❑ In acute care facilities, where the year 2000 turnover rate was 21.3%, replacement cost for one nurse (\$92,442) was twice the national average salary for a medical-surgical nurse (\$46,832);
  - ❑ replacing a specialty nurse increased it to \$145,000 (HSM Group, 2002, Price 2001).
  - ❑ Were a hospital with 100 nurses to face such turnover, annual replacement expenditure for medical-surgical nurses alone would reach \$1,969,000 in expenses for advertising and interviewing, increased use of traveling nurses, overtime, temporary replacement costs for per diem nurses, lost productivity, training, and terminal payouts (Colosi, 2002).

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# HCSA Nurse Workforce

- Patient outcomes cost:
  - Aiken et al. (2002) found that each additional patient in excess of a 4:1 patient/nurse ratio is associated with a 7% increase in the chance of failure to rescue and 7% increase likelihood of the patient dying within 30 days of admission;
  - a 6:1 ratio increased the chance of death by 2.3 per 1,000 and 8:1 ratio increased it by an additional 8.7;
  - for every patient over a 4:1 ratio, the odds of nurse burnout increased by 23% and job dissatisfaction increased by 15%.
- The high patient/nurse ratios produced by nursing workforce shortage worsen that very shortage by increasing nurse burnout and job dissatisfaction.
- The loss of older, expert nurses could disproportionately impact patient safety and quality of care, resulting in an increase in poorer patient outcomes and more adverse events. (Aiken et al., 2002; see also Needleman et al., 2002)

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# HCSA Older Nurse Workforce

- The “older nurse” literature focuses on retention. Titles are suggestive: “keeping the wisdom at work” (Simons, 2007), “the older nurse ... does age matter?” (Norman et al., 2005), “retaining the older nurse” (Litvak 2002, 2003, 2005).
- Older nurses now comprise a third or more of the health care workforce (HRSA, 2005; Minnick, 2000; Buerhaus, 2000).
- In all 49% of nurses are now boomers who, in 2002, began to reach age 55, historically the onset of reduced hours and retirement (Minnick, 2000).
- Calls abound, e.g. from the American Nursing Association and state hospital associations, for measures to retain nurses past the age of retirement (Thrall, 2005).

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# HCSA Older Nurse Workforce

- A recent Robert Wood Johnson Foundation report (Hatcher et al., 2006) ties retention directly to employee wellness-related policy and programs:
  - Benefits: Not only fundamental benefits such as health insurance, paid vacation, and retirement programs (Spetz, Adams, 2006) but also supplemental wellness benefits such as on-site fitness facilities and wellness and prevention programs (health screenings, immunization clinics) and prevention and wellness education and information (Russell et al., 2005) impact nurse recruitment and retention.
  - Satisfaction: For the nursing no less than the non-nursing sectors of the hospital workforce, "the most effective solution to recruitment and retention" is for the hospital "to become a good place to work" (Thrall, 2005).

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# HCSA Older Nurse Workforce

- Satisfaction: (cont)
  - Correspondingly, nurse satisfaction is influenced not only by nurse managers' leadership style and by nurses' mobility chances (Boyle et al., 1999; Leveck, Jones 1996; Taunton et al., 1997; Peterson, 2001) but also by workplace organizational and environmental characteristics, including strategies that enhance nurses' autonomy and policies that create esprit de corps (Tang, 2003) each of which are bolstered by wellness program opportunities.
  - Thus a variety of nurse workforce studies collectively suggest that job satisfaction is enhanced by wellness-related policy and programs: offering on- and off-the-job opportunities for renewal; promoting managerial respect for workers and shared decision-making; honoring the spiritual aspects of health care work and workers; promoting staff development in all its dimensions (Neuhauser, 2002; Laschinger, Finegan, 2005; Veninga, 2003; McGuire et al., 2003).

# Conclusion

- Medline Key Word search “shift work” “metabolic syndrome” 10January2011 yielded 35 citations, 25 of which 2008 ff. Pathways include Light at night, Circadian rhythm disruption, Eating on shift. Adding “ healthcare” yielded:
  - [\[Shift work and cardiometabolic risk\]](#). Copertaro A, Barbaresi M, Bracci M. Recent Prog Med. 2009 Nov;100(11):502-7. Italian. PMID: 20066881 [PubMed - indexed for MEDLINE][Related citations](#)
  - [Incidence of metabolic syndrome among night-shift healthcare workers](#). Pietroiusti A, Neri A, Somma G, Coppeta L, Iavicoli I, Bergamaschi A, Magrini A. Occup Environ Med. 2010 Jan;67(1):54-7. Epub 2009 Sep 7. PMID: 19737731 [PubMed - indexed for MEDLINE][Related citations](#)
  - [\[Role of waist circumference in the diagnosis of metabolic syndrome and assessment of cardiovascular risk in shift workers\]](#). Copertaro A, Bracci M, Barbaresi M, Santarelli L. Med Lav. 2008 Nov-Dec;99(6):444-53. Italian. PMID: 19086616 [PubMed - indexed for MEDLINE][Related citations](#)
  - [Assessment of cardiovascular risk in shift healthcare workers](#). Copertaro A, Bracci M, Barbaresi M, Santarelli L. Eur J Cardiovasc Prev Rehabil. 2008 Apr;15(2):224-9. PMID: 18391652 [PubMed - indexed for MEDLINE][Related citations](#)

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# Conclusion

- Medline Key Word search “night work” “metabolic syndrome” 10January2011 yielded 3 citations, same Pathways:
  - Food intake during the normal activity phase prevents obesity and circadian desynchrony in a rat model of night work. Salgado-Delgado R, Angeles-Castellanos M, Saderi N, Buijs RM, Escobar C. Endocrinology. 2010 Mar;151(3):1019-29. Epub 2010 Jan 15.PMID: 20080873 [PubMed - indexed for MEDLINE][Related citations](#)
  - Metabolic syndrome in permanent night workers. Biggi N, Consonni D, Galluzzo V, Sogliani M, Costa G. Chronobiol Int. 2008 Apr;25(2):443-54.PMID: 18484373 [PubMed - indexed for MEDLINE][Related citations](#)
  - Assessment of cardiovascular risk in shift healthcare workers. Copertaro A, Bracci M, Barbaresi M, Santarelli L. Eur J Cardiovasc Prev Rehabil. 2008 Apr;15(2):224-9.PMID: 18391652 [PubMed - indexed for MEDLINE][Related citations](#)

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# Conclusion

## Incidence of metabolic syndrome among night-shift healthcare workers.

Pietroiusti A, Neri A, Somma G, Coppeta L, Iavicoli I, Bergamaschi A, Magrini A. Occup Environ Med. 2010 Jan;67(1):54-7. Epub 2009 Sep 7. PMID: 19737731 [PubMed - indexed for MEDLINE] [Related citations](#)

**OBJECTIVE:** Night-shift work is associated with ischaemic cardiovascular disorders. It is not currently known whether it may be causally linked to metabolic syndrome (MS), a risk condition for ischaemic cardiovascular disorders. The syndrome presents with visceral obesity associated with mild alterations in glucidic and lipidic homeostasis, and in blood pressure. The aim of this study was to assess whether a causal relationship exists between night-shift work and the development of MS.

**METHODS:** Male and female nurses performing night shifts, free from any component of MS at baseline, were evaluated annually for the development of the disorder during a 4-year follow-up. Male and female nurses performing daytime work only, visited during the same time period, represented the control group.

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# Conclusion

**RESULTS:** The cumulative incidence of MS was 9.0% (36/402) among night-shift workers, and 1.8% (6/336) among daytime workers (relative risk (RR) 5.0, 95% CI -2.1 to 14.6). The annual rate of incidence of MS was 2.9% in night-shift workers and 0.5% in daytime workers. Kaplan-Meier survival curves of the two groups were significantly different (log-rank test;  $p < 0.001$ ). Multiple Cox regression analysis (forward selection method based on likelihood ratio) showed that among selected variables (age, gender, smoking, alcohol intake, familiar history, physical activity, and work schedule) the only predictors of occurrence of MS were sedentariness (hazard ratio (HR) 2.92; 95% CI 1.64 to 5.18;  $p = 0.017$ ), and night-shift work (HR 5.10; 95% CI 2.15 to 12.11;  $p < 0.001$ ).

**CONCLUSIONS:** The risk of developing MS is strongly associated with night-shift work in nurses. Medical counselling should be promptly instituted in night-shift workers with the syndrome, and in case of persistence or progression, a change in work schedule should be considered.

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# References

- AANC (American Association of Colleges of Nursing) April 2009. Fact Sheet: Nursing Shortage. Available at [www.aacn.nche.edu/media/FactSheets/NursingShortage.htm](http://www.aacn.nche.edu/media/FactSheets/NursingShortage.htm).
  - AHA (American Hospital Association) November 2008. Fast Facts on US Hospitals. Available at <http://www.aha.org/aha/about/index.html>.
  - AHA (American Hospital Association) July 2007. Health and Hospital Trends (2007). Available at <http://www.aha.org/aha/research-and-trends/health-and-hospital-trends/2007.html>.
  - Aiken LH, Clarke SP, Sloane DM. Hospital Nurse Staffing and Patient Mortality, Nurse Burnout and Job Dissatisfaction. Journal of the American Medical Association. 2002 288(16): 1987– 1993.
  - BLS (Bureau of Labor Statistics) 2009. Division of Information Services. Labor Force Statistics from the Current Population Survey: Labor force statistics with demographic characteristics available from the Current Population Survey (CPS). N.D. Available at <http://www.bls.gov/cps/demographics.htm>. Last modified April 3, 2009.
  - BLS (Bureau of Labor Statistics) July 2008. Division of Information Services. And Older workers: Are there more older people in the workplace? Available at [http://www.bls.gov/spotlight/2008/older\\_workers/](http://www.bls.gov/spotlight/2008/older_workers/).
  - Boyle DK, Bott MJ, Hansen HE, et al. Managers' Leadership and Critical Care Nurses' Intent-to-Stay. American Journal of Critical Care. 1999 9(5): 361– 371.
  - Buerhaus PI, Staiger DO, Auerbach DI. Implications of an Aging Registered Nurse Workforce. JAMA. 2000 283(22): 2948–2954.
  - [Buerhaus PI](#), [Staiger DO](#), [Auerbach DI](#). New signs of a strengthening U.S. nurse labor market? Health Aff (Millwood). 2004 Jul-Dec;Suppl Web Exclusives:W4-526-33.
  - [Buerhaus PI](#). Current and future state of the US nursing workforce. JAMA. 2008 Nov 26;300(20):2422-4.
  - [Choudhry S](#), [Choudhry NK](#), [Brennan TA](#). Health Aff (Millwood). Specialty versus community hospitals: what role for the law? 2005 Jul-Dec;Suppl Web Exclusives:W5-361-72.
  - Colosi ML. Rules of Engagement for the Nursing Shortage: More Registered Nurses on Staff Leads to Lower Hospital Costs. JONA's Healthcare Law, Ethics, and Regulation. 2002 4(3): 50–54.
  - CPNS (Council on Physician and Nurse Supply) March 2008. Finding Solutions to the Healthcare Staffing Shortage. Available at <http://www.physiciannursesupply.com/>.
  - Dohm A, Schniper L. Occupational employment projections to 2016. Monthly Labor Review, November 2007, 86-125. Available at <http://www.bls.gov/opub/mlr/2007/11/art5full.pdf>.
  - Goetzel, RZ, Ozminkowski, RJ, Baase, CM, & Billotti, GM.. Estimating the Return-on-Investment from Changes in Employee Health Risks on the Dow Chemical Company's Health Care Costs. Journal of Occupational and Environmental Medicine. 2005 47:8, 759-768.
  - Hatcher B, Bleich MR, Connolly C, Davis K, O'Neill Hewlett P, Stokley Hill K. Wisdom at Work: The Importance of the Older and Experienced Nurse in the Workplace. Princeton, New Jersey: The Robert Wood Johnson Foundation, June 2006. Available at [www.rwjf.org/files/publications/other/wisdomatwork.pdf](http://www.rwjf.org/files/publications/other/wisdomatwork.pdf).
-

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# References

- Hayden EW. [Nonprofit hospitals face structural as well as financial challenges: lessons from Massachusetts](#). Hosp Top. 2005 Summer;83(3):2-7.
  - He W, Sengupta M, Velkoff VA, and DeBarros KA. U.S. Census Bureau, Current Population Reports, P23-209, 65+ in the United States: 2005, U.S. Government Printing Office, Washington, DC, 2005.
  - HSM Group, Ltd. Acute Care Hospital Survey of RN Vacancy and Turnover Rates in 2000. Journal of Nursing Administration. 2002 32(9): 437–439.
  - HRSA (Health Resources and Services Administration Services) April 2006. What is Behind HRSA's Projected Supply, Demand, and Shortage of Registered Nurses? Available at <http://bhpr.hrsa.gov/healthworkforce/reports/behindrnprojections/index.htm>.
  - HRSA (Health Resources and Services Administration Services) 2005, Preliminary Findings: 2004 National Sample Survey of Registered Nurses. Washington: U.S. Department of Health and Human Services, 2005. Available at: <http://bhpr.hrsa.gov/healthworkforce/reports/rnpopulation/preliminaryfindings.htm>.
  - IOM (Institute of Medicine). Committee on the Future Health Care Workforce for Older Americans, Institute of Medicine. Retooling for an Aging America: Building the Health Care Workforce. The National Academy Press: 2008.
  - Laschinger HKS and Finegan J. Using Empowerment to Build Trust and Respect in the Workplace: A Strategy for Addressing the Nursing Shortage. 2005 Nursing Economics, 23(1):6–13.
  - Litvak S. Retaining the Older Nurse. Journal of Nursing Administration. 2002. 32(7/8): 387–392
  - Leveck ML, Jones CB. The Nursing Practice Environment, Staff Retentions, and Quality of Care. Research in Nursing & Health. 1996 19(4): 331–343.
  - [Malik S, Wong ND, Franklin SS, Kamath TV, L'Italien GJ, Pio JR, Williams GR](#). Impact of the metabolic syndrome on mortality from coronary heart disease, cardiovascular disease, and all causes in United States adults. Circulation. 2004 Sep 7;110(10):1245-50. Epub 2004 Aug 23.
  - McGuire M, Houser J, Jarrar T, et al. Retention: It's All About Respect. Healthcare Manager. 2003 22(1): 38–44.
  - Minnick AF. [Retirement, the nursing workforce, and the year 2005](#). Nurs Outlook. 2000 Sep-Oct;48(5):211-7. Review.
  - Mosisa A, Hipple S, Trends in labor force participation in the United States. Monthly Labor Review, October 2006, Vol. 129, No. 10, 35-57.
  - Needleman J, Buerhaus P, Mattke M, et al. Nurse Staffing Levels and Quality of Care in Hospitals. New England Journal of Medicine. 2002 346(22): 1715–1722.
  - Neuhauser PC. Building a High-Retention Culture in Healthcare: Fifteen Ways to Get Good People to Stay. Journal of Nursing Administration. 2002 32(9): 471.
  - NHLBI (National Heart, Lung, and Blood Institute) 1998. The Clinical Guidelines on the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults: The Evidence Report, NIH Publication No. 98-4083, September 1998, produced by the National Heart, Lung, and Blood Institute in cooperation with the National Institute of Diabetes and Digestive and Kidney Diseases. Available at: [http://www.nhlbi.nih.gov/guidelines/obesity/ob\\_home.htm](http://www.nhlbi.nih.gov/guidelines/obesity/ob_home.htm).
  - NHLBI (National Heart, Lung, and Blood Institute), North American Society for the Study of Obesity. The Practical Guide: Identification, Evaluation, and Treatment of Overweight and Obesity in Adults. NIH Publication No 00-4084. October 2000. Available at [http://www.nhlbi.nih.gov/guidelines/obesity/prctgd\\_c.pdf](http://www.nhlbi.nih.gov/guidelines/obesity/prctgd_c.pdf).
-

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# References

- NIOSH (National Institute for Occupational Safety and Health) 2008. NIOSH Program Portfolio: Health Care and Social Assistance. Available at <http://www.cdc.gov/niosh/programs/hcsa/default.html>. Page last updated: October 20, 2008.
- [Norman LD](#), [Donelan K](#), [Buerhaus PJ](#), [Willis G](#), [Williams M](#), [Ulrich B](#), [Dittus R](#). The older nurse in the workplace: does age matter. *Nurs Econ*. 2005 Nov-Dec;23(6):282-9, 279.
- Ogden CL, Carroll MD, McDowell MA, Flegal KM. Obesity among adults in the United States – no change since 2003—2004. NCHS data brief no 1. Hyattsville, MD: National Center for Health Statistics, 2007.
- Peterson C. Nursing Shortage: Not a Simple Problem—No Easy Answers. *Online Journal of Issues in Nursing*. 2001 6(1). Available at: [http://www.nursingworld.org/ojin/topic14/tpc14\\_1.htm](http://www.nursingworld.org/ojin/topic14/tpc14_1.htm).
- Russell D, Rix S and Brown K. Staying Ahead of the Curve 2004: Employer Best Practices for Mature Workers. Washington: AARP, 2004. Available at: <http://www.aarp.org/research/work/employment/aresearch-import-892.html>.
- [Schmier JK](#), [Jones MI](#), [Halpern MT](#). Cost of obesity in the workplace. *Scand J Work Environ Health*. 2006 Feb;32(1):5-11.
- [Schulte PA](#), [Wagner GR](#), [Ostry A](#), [Blanciforti LA](#), [Cutlip RG](#), [Krajnak KM](#), [Luster M](#), [Munson AE](#), [O'Callaghan JP](#), [Parks CG](#), [Simeonova PP](#), [Miller DB](#). Work, obesity, and occupational safety and health. *Am J Public Health*. 2007 Mar;97(3):428-36. Epub 2007 Jan 31.
- Spetz J, Adams S. [How can employment-based benefits help the nurse shortage?](#) *Health Aff (Millwood)*. 2006 Jan-Feb;25(1):212-8.
- Tang JH-C. Evidence-Based Protocol: Nurse Retention. *Journal of Gerontological Nursing*. 2003 29(3): 5–14.
- Taunton RL, Boyle DK, Wood CQ, et al. Manager Leadership and Retention of Hospital Staff Nurses. *Western Journal of Nursing Research*. 1997 19(2): 205–226.
- Thrall T. Retirement Boom? *Hospitals and Health Network*. 2005 79(11): 30–38.
- USGAO (U.S. Government Accountability Office) July 2001. [Nursing Workforce: Emerging Nurse Shortages Due to Multiple Factors](#) (GAO-01-944). Available at <http://www.aacn.nche.edu/media/FactSheets/NursingShortage.htm>.
- Veninga RL. Transforming the Workplace. *Health Progress* (online edition), May/June 2003. Available at: [http://www.findarticles.com/p/articles/mi\\_qa3859/is\\_200305/ai\\_n9268405#continue](http://www.findarticles.com/p/articles/mi_qa3859/is_200305/ai_n9268405#continue).
- [Zelenock GB](#), [Zambricki CS](#). The health care crisis: impact on surgery in the community hospital setting. *Arch Surg*. 2001 May;136(5):585-91.