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Massachusetts Study

Research from the University of Massachusetts shows a strong link between working overtime and sustaining a work-related injury. This was found to be true for all occupations… working longer hours (12 hours a day or more) was associated with a 37 percent increase in risk.

(Chantal Britt, Bloomberg, "Overtime, Long Houses Increase Illness, Injury Risk, Study Shows," August 22, 2006.)

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States Which Ban or Limit Forced Overtime

California
Connecticut
Maine
Maryland
Minnesota
New Jersey
Oregon
Texas
Washington
West Virginia
Illinois

California

Regulations adopted in California prior to 2001 prevent an employee scheduled to work a 12 hour shift from working more than 12 hours in a 24 hour period except in a health care emergency.

Connecticut

Connecticut enacted legislation banning a hospital from requiring a nurse to work in excess of a predetermined scheduled work shift except in certain circumstances such as participating in a surgical procedure until the procedure is completed, public health emergency, etc.

Maine

Legislation enacted in 2001 in **Maine** would prevent a nurse from being disciplined for refusing to work more than 12 consecutive hours except in certain circumstances and must be given 10 consecutive hours off following overtime.

Maryland

Maryland lawmakers ruled in 2002 that an employer may not require a nurse to work more than the regularly scheduled hours according the predetermined work schedule.

Minnesota

in 2002, a **Minnesota** law was implemented prohibiting action against a nurse who refuses mandatory overtime because it would jeopardize patient safety.

New Jersey

New Jersey enacted legislation to prevent a health care facility from requiring an employee to work in excess of an agreed to, predetermined and regularly scheduled daily work shift, not to exceed 40 hours per week.

Oregon

In 2005, Oregon's mandatory overtime law, originally enacted in 2001, was amended to prohibit a hospital from requiring a nurse to work more than 48 hours in a week or more than 12 consecutive hours in a 24-hour period.

Texas

Texas regulations passed in 2002 require hospitals to develop policy and procedures for mandatory overtime.

Washington

Washington State's new language states that acceptance of mandatory overtime by a nurse is strictly voluntary and refusal is not grounds for adverse actions against the nurse.

West Virginia

In 2004, **West Virginia** enacted legislation prohibiting a hospital from mandating a nurse to accept an assignment of overtime.

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Illinois

Passed in 2005, **Illinois legislation** allows hospitals to mandate a nurse to work overtime only in unforeseen emergent circumstances.

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Additional States Lining Up

There is legislation banning the use of mandatory overtime pending in the following states:

Alaska	**Florida**	**Georgia**
Hawaii	**Iowa**	**Michigan**
Missouri	**New York**	**Ohio**
Pennsylvania	**Rhode Island**	**Tennessee**
Vermont	**Nevada**	**Massachusetts**

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Support Alaska Senate Bill 28

Your nurse will always be there for you in time of an unforeseen emergency situation, disease outbreak, natural or man-made disaster.

Your nurse will be able to voluntarily work overtime so long as the work is consistence with professional standards of safe patient care and does not exceed 14 consecutive hours.

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Support Alaska Senate Bill 28

But with SB 28, a nurse will be able to say, "Stop, I can't do this anymore tonight." That same nurse could say, "I have worked my shift; I'm tired; and possibly I'm not as swift as I would otherwise be if I had some rest. My patients could possibly be at risk if I push on any longer."

Knowing his or her own limits, the nurse can refused to be assigned the forced overtime in the first place. Our nurse would now be able to do this without fear of reprisal or loss of job.

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Association

We Urge Your Support for SB28

It's common sense

It will protect the individual patient

It will protect the Registered Nurse

It will even protect the healthcare facility

It will enhance the nursing profession

It will help recruit nurses

It will help retain nurses

It's good public policy

Thank you.

AaNA
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Senator Bettye Davis

Senate Bill 28

"An Act relating to limitations on mandatory overtime for registered nurses and licensed practical nurses in health care facilities; and providing for an effective date."

Sectional Analysis

Note: As a preliminary matter, this sectional analysis should not be considered an authoritative interpretation of the bill; the bill itself is the best statement of its contents.

Section 1. Adds a temporary law section on legislative findings and intent concerning administration of overtime provisions in the nursing profession.

Section 2. Adds an "Article 4" to AS 18.20, that includes the following sections concerning working hours for nurses:

Sec. 18.20.0400. Subsection (a) prohibits the use of direct or indirect coercion to cause a nurse in a health care facility to:

(1) **"work beyond a predetermined and regularly scheduled shift that is agreed to by the nurse and the health care facility;**
(2) **work beyond 80 hours in a 14-day period; or to**
(3) **accept an assignment of overtime if, in the judgment of the nurse, the overtime would jeopardize patient or employee safety."**

Subsection (b) requires that the nurse shall not have less than 10 consecutive hours of off-duty time immediately following the end of work on a predetermined and regularly scheduled shift agreed to by the nurse and the health care facility.

Subsection (c) lists exceptions to subsection (a) (see below):

Exceptions to subsection (a):

(1) **"a nurse voluntarily working overtime on an aircraft in use for medical transport . . . ."**
(2) **"a nurse on duty in overtime status because of an unforeseen emergency situation that could otherwise jeopardize patient safety . . . ."**
(3) **"a nurse fulfilling on-call time that is agreed upon by the nurse and a health care facility before it is scheduled;**
(4) **a nurse voluntarily working overtime so long as the work is consistent with professional standards and safe patient care and doe not exceed 14 consecutive hours;**
(5) **a nurse voluntarily working beyond 80 hours in a 14-day period so long as the nurse does not work more than 14 consecutive hours without a 10-hour break and the work is consistent with professional standards and safe patient care;**
(6) **the first hour on overtime status when the health care facility is obtaining another nurse to work in place of the nurse in overtime status."**

Sec. 18.20.410 Prohibits any kind of retaliation against a nurse for exercising rights or reporting violations under the other sections of the bill should they become law.

Sec. 18.20.420 Requires a health care facility to provide an anonymous process by which a patient or a nurse may make a complaint about staffing levels and patient safety that relates to overtime work by nurses and to limitation on overtime work by nurses under AS 18.20.400.

Sec. 18.20.430 Requires the Commissioner of Labor and Workforce Development to administer the overtime limitations for nurses established by the bill and adopt regulations for implementing and enforcing them. It establishes a complaint procedure, and a schedule of penalties to be imposed upon a health care facility if a complaint under the established procedure leads to the Commissioner finding a "knowing" violation of the new limitations on nursing overtime. "Knowingly" is defined in the same section when "the facility is either aware that its conduct is of a nature prohibited by the overtime provision or aware that the circumstances described in the overtime prohibition exist;" or in proving the existence of a particular fact that the "facility is aware of a substantial probability of its existence, unless the facility reasonably believes it does not exist."

Sec. 18.20.440 Provides the procedure for semiannual reporting requirements by health care facilities for each nurse, including the number of overtime hours that were

mandatory, voluntary, or on-call. On-call hours are further identified as mandatory or voluntary.

Sec. 18.30.449 Defines key words, including "health care facility," "nurse," "on-call," and "overtime."

Section 3. Requires that if the bill becomes law the filing of the first semi-annual reports under AS 18.20.440 must be filed before February 1, 2008 for the period July 1, 2007 through December 31, 2008.

Section 4. requires that the reporting requirements of AS 18.20.440 take effect July 1, 2007.

Section 5. provides for an effective date of January 1, 2008 for parts of the bill not made effective on July 1, 2007.

FISCAL NOTE

STATE OF ALASKA
2007 LEGISLATIVE SESSION

Fiscal Note: **SB28-DOLWD-WH-03-30-07**
Bill Version: **SB 28**
() Publish Date:

Revision Date/Time (Note if correction):
Title: **Limit Overtime for Registered Nurses**

Department: **Labor and Workforce Development**
RDU: **Labor Standards and Safety**
Component: **Wage and Hour**

Sponsor: **Senator Davis**
Requester: **Senate HES**

Component Number: **345**

Expenditures/Revenues (Thousands of Dollars)

Note: Amounts do not include inflation unless otherwise noted below.

OPERATING EXPENDITURES	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Personal Services	68.2	68.2	68.2	68.2	68.2	68.2
Travel	3.0	3.0	3.0	3.0	3.0	3.0
Contractual	8.9	8.9	8.9	8.9	8.9	8.9
Supplies	3.8	0.5	0.5	1.8	0.5	0.5
Equipment						
Land & Structures						
Grants & Claims						
Miscellaneous						
TOTAL OPERATING	**83.9**	**80.6**	**80.6**	**81.9**	**80.6**	**80.6**
CAPITAL EXPENDITURES						
CHANGE IN REVENUES ( )						

FUND SOURCE (Thousands of Dollars)

1002 Federal Receipts						
1003 GF Match						
1004 GF	83.9	80.6	80.6	81.9	80.6	80.6
1005 GF/Program Receipts						
1037 GF/Mental Health						
Other (Specify Type--Do not abbreviate)						
TOTAL	**83.9**	**80.6**	**80.6**	**81.9**	**80.6**	**80.6**

Estimate of any current year (FY2007) cost: None
Mark this box (X) if funding for this bill is included in the Governor's FY 2008 budget proposal:

POSITIONS

Full-time	1	1	1	1	1	1
Part-time						
Temporary						

ANALYSIS: *(Attach a separate page if necessary)*

The bill requires the Department of Labor and Workforce Development to investigate complaints, collect evidence, interview witnesses, subpoena records and make determinations regarding overtime worked by registered nurses. There are currently approximately 5,000 registered nurses working in Alaska and this is projected to be a rapidly growing occupation. The anticipated workload will require a full-time Wage & Hour Investigator I position funded with General Funds. Costs include $68.2 for salary and benefits and $15.7 in various associated position costs including $3.3 of one-time position costs for basic office equipment.

Prepared by: **Grey Mitchell, Director** Phone: **465-4855**
Division: **Labor Standards & Safety** Date/Time: **3/30/07 2:34 PM**
Approved by: **Click Bishop, Commissioner** Date: **3/30/2007**
Agency: **Department of Labor and Workforce Development**

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Senator Bettye Davis

Senate Bill 28

"An Act relating to limitations on mandatory overtime for registered nurses and licensed practical nurses in health care facilities; and providing for an effective date."

Additional facts and justification for SB 28

I. Unregulated mandatory overtime leads to insidious and pervasive harm to nurses, patients, the profession, and health care facilities.

- Mandatory overtime hours are compulsory (as opposed to voluntary) and above an agreed upon, predetermined, regularly scheduled shift. Many nurses are told they are expected to "voluntarily" work a number of overtime shifts due to a shortage of nurses in a particular shift, discipline, or facility, such as emergency room, surgery, or mental health shifts in private or state institutions.
- Many nurses fear reprisals if they do not consent, accede, or acquiesce to work overtime shifts when they are exhausted or planning time off for their families or their own wellbeing. The threat of reprisals may not be overt or express, and includes but is not limited to assignment to unattractive tasks or work shifts, poor performance evaluations, denial of salary increases or promotion, discipline, or demotion, or discharge. In extreme cases, reprisals can include retaliatory reporting to the nursing board, licensure suspension or revocation actions, and charges of "patient abandonment."
- Many registered nurses are leaving the profession because of workplace stress, long work hours, and mandatory overtime.
- Fewer women, the traditional care givers, are choosing nursing as a career, since opportunities have opened up in many other less demanding professions.
- The Institute of Medicine and National Council of State Boards of Nursing estimated in 1999 that 1 million medical errors per year resulted in 44,000-120,000 fatalities, costing $69 billion, or $575,000 per death, and sleep deprivation and fatigue contributed significantly to the risk of human errors. According to the National Institute for Occupational Safety and Health, when staff plan to work additional shifts on a voluntary basis, they are more likely to be prepared and to get plenty of rest immediately prior to working extended shifts. However, when an employer requires mandatory overtime, this usually occurs with little or no prior notice. The results often are high levels of fatigue and increased errors. These errors can result in life-threatening situations for both

the patient and the nurse, including back injuries for the nurse, patient medication errors, and even death. At the same time, health care facilities and nurses are subjected to increased liability.

II. The nursing shortage increases mandatory overtime which often can be used as a routine staffing tool to limit needed new hires.

- There is a shortage of 430,000 nurses nationwide and this number is expected to increase to over 1 million sometime after 2010 due to increasing retirements and departures of an aging nursing population (average age 43) and fewer replacements.
- Greatest nursing shortages in Alaska are found in state institutions which usually do not have pay rates competitive with private health care facilities. State nursing pay increases of 15% in July, 2006 reportedly still do not match pay rates in private health care facilities.
- While some large private health care facilities can afford to pay premium rates to hire all the permanent full-time and temporary "traveling nurses" positions they need, they still use mandatory overtime as a "staffing tool" to limit placing more nurses on the payroll. It is less costly to pay mandatory overtime than to hire permanent employees with contractual rights and benefits. State institutions, on the other hand, often cannot attract enough qualified nurses due to lower pay.
- The physician shortage in Alaska also exacerbates the nurses' mandatory overtime problem, because nurses are under more pressure to work longer hours and shoulder more responsibility when physicians are not available.

III. Compensation of "time and one-half" is no long a deterrent to employers' use of mandatory overtime hour, nor is it a great incentive to employees who are constantly fatigued by the extra work hours.

- Public policy dictates that the legislature must protect registered and licensed practical nurses and their patients from work abuses in a health care system which can easily subsume their individual wellbeing into corporate and bureaucratic strictures. Some overtime may always be necessary, but when it becomes a pattern or planned mandatory practice, it defeats the purpose of the Fair Labor Standards Act (FLSA) of 1938. The main objective of the act was to eliminate "*labor conditions detrimental to the maintenance of the minimum standards of living necessary for health, efficiency and well-being of workers.*"
- The FLSA was made applicable to hospitals, nursing homes, or other residential care facilities in the 1961 amendment determining "enterprise coverage." The FLSA created a monetary penalty, *i.e.*, time and one-half for overtime, directed against employers who did not spread their existing work among a greater number of employees. State law covers the same workers as regards overtime. The FLSA was premised on the economic theory that if overtime became too expensive, it would force employers to hire more people instead of working the few to exhaustion.
- Now 70 years after enactment, the FLSA operates in a larger, stronger, and more diverse economy with other pressures on business besides capital and labor. Thus, the monetary penalty of time and one-half for overtime hours is no longer a major deterrent to employer abuse of mandatory overtime hours for nurses.
- Nurses, on the other hand, can only offer or withhold their labor in controlling their working conditions and quality of life. Working mandatory or voluntary overtime hours for extra pay has decreasing appeal to nurses who regularly must work extended overtime shifts. At some point, enough is enough. The fatigue and lack of personal or family time becomes increasingly onerous, while the safety and care of patients declines.

Mandatory Overtime

Position

ANA opposes the use of mandatory overtime as a staffing tool.

Background

Nurses report a dramatic increase in the use of mandatory overtime as a staffing tool and fear potential consequences for the safety and quality of care provided to their patients. Today, overtime (mandatory and voluntary) is the most common method facilities use to cover staffing insufficiencies. In fact, some employers have described mandatory overtime as a staffing model and have actually coined the term "mandation" to define the methodology. Many nurses contend employers insist they work an extra shift (or more) or face dismissal for insubordination and being reported to the state board of nursing for patient abandonment.

Federal regulations place limits on the amount of time that can be worked in other industries in which the work directly affects public safety (e.g., aviation and transportation). Those regulations also set requirements for defined periods of time that workers must rest or be off duty before returning to work. Health care is exempt from such overtime regulations.

A few United American Nurse bargaining units have been successful in negotiating limits on mandatory overtime. In fact, concerns about the effects of mandatory overtime were central concerns in recent strikes in Washington, D.C., Minnesota, and New York.

Rationale

The American Nurses Association (ANA) is concerned about the impact of mandatory overtime on the ability of our nation's acute care nurses to provide high-quality health care services. ANA believes that the elimination of mandatory overtime for the nation's nurses is a critical step in efforts to improve the quality of health care and reduce medical errors. Following are a few facts about the dangers of forced overtime:

- Nurses are, in general, an aging workforce. The average working nurse is slightly over 43 years of age.
- Increased reliance on mandatory overtime has occurred at the same time that patient acuity has increased, the use of sophisticated technology has increased, and the length of hospital stay has decreased.
- Research in 1977 by Dawson and Reid at the University of Australia showed that "work performance is more likely to be impaired by moderate fatigue than by alcohol consumption." Their research shows that workers staying awake for long periods pose significant safety risks.
- Sleep loss influences several aspects of performance, slowing thinking and reaction time, delaying responses, causing failure to respond when appropriate or false responses, and diminishing memory, among others.

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What will legislation regulating mandatory overtime really do?

The mandatory overtime legislation being suggested does not prohibit nurses from working overtime. It will discourage an employer from assigning mandatory overtime and will prohibit an employer from threatening or retaliating against a nurse who refuses overtime. It will support the nurse who believes patient care would be compromised if that nurse is forced to work overtime. We must be able to count on the professional nurses who are providing care to make the judgment call about whether or not they are safe to practice.

Basic Facts on Mandatory Overtime

In the United States there has been an overall increase in overtime hours for all American workers over the last two decades. Almost one third of the workforce regularly works more than 40-hours a week and one fifth work more than 50 hours. It has been no different in health care where working overtime is becoming an every day occurrence. "Time after Time: Mandatory Overtime in the US Economy" Briefing Paper. January 2002. 1

"Mandatory overtime hours" are those hours above an agreed upon, predetermined, regularly scheduled shift, that the employer makes compulsory (as opposed to voluntary) with the threat of job loss or reprisals such as discharge, discipline, demotion or assignment to unattractive tasks or work shifts or in some cases licensure removal, retaliatory reporting, and charges of "abandonment". RN schedules are often 12, 10 or 8 hour shifts and some nurses do not get overtime for staying additional time unless they have reached 40 hours in one week. For example, a RN could work their regular 8 hour shift, but then be mandated to work an additional 8 hours for a total of 16, but not qualify for overtime pay.

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1 - 18 page report available at http://www.epinet.org/briefingpapers/120/bp120.pdf

Why do nurses care so much about the issue of mandatory overtime?

Mandatory overtime contributes to poor quality patient care because fatigue and loss of concentration ability, which results from excessive overtime, increases the likelihood of errors. According to a study by the National Institute for Occupational Safety and Health (NIOSH), when staff plan to work additional shifts on a volunteer basis, they are more likely to be prepared and get plenty of rest immediately prior to working the extended shift. However, when overtime is mandated by an employer, this occurs with little or no prior notice. The result is high levels of fatigue and thus increased errors. 2

Why Should We Worry About Mandatory Overtime for Nurses? Patient Safety...

For nurses, these errors or mistakes may cause life threatening situations for both patient and the nurse (from back injuries to med errors to client deaths). With these mistakes and errors, there is also the chance of law suits with loss of licenses and increases in malpractice insurance rates. The evidence is very strong that prolonged work hours and fatigue affect worker performance. The Agency for Healthcare Research and Quality (AHRQ), a division of U.S. Department of Health and Human Services was authorized to contract with the IOM to study nurse work hours and health care errors. 3

The study and subsequent large report by the Institute of Medicine, provides compelling evidence that nurses' working long hours has an adverse effect on patient safety.

The Institute of Medicine estimates between 44,000 to 98,000 hospital deaths can be attributed to medical errors each year. Mandatory overtime is a serious contributing factor to medical errors. The final recommendation of the IOM is that all overtime, voluntary and mandatory/involuntary done by Nurses should be curtailed. 4

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2 Occupational Health and Safety Administration (OSHA) http://www.osha.gov. National Institute for Occupational Safety and Health(NIOSH) http://www.cdc.gov/niosh. Spurgeon A, Harrington JM, Cooper CL. Health and safety problems associated with long working hours: a review. Occupational and Environmental Medicine. 1997 June, 54(6):367-75. Tucker P, Barton J, Folkard S. Comparison of eight and 12 hour shifts: impacts on health, wellbeing, and alertness during the shift. Occupational and Environmental Medicine. 1996 Nov, 53(11):767-72. Lawrence Mishel, Jared Bernstein and John Schmitt. The State of Working America 2000-2001. Economic Policy Institute. Washington, D.C. 2001. pp. 454.

3 This decision can be viewed at http://www.nap.edu/openbook/0309090679/html/23.html#pagetop .

4 See brief article and/or order the study at: http://www.iom.edu/project.asp?id=4671 http://www.iom.edu/report.asp?id=16173

A recent study, published in July 2004, shows a strong link between medical errors and the long work hours of nurses and it has called on congress to take action on the Safe Nursing and Patient Care Act (H.R. 745, S. 373), which would strictly limit the use of mandatory overtime for nurses. 5

Ann E Rogers, Wei-Ting Hwang, Linda D. Scott, Linda H. Aiken, and David F. Dinges did an important study called, "The Working Hours Of Hospital Staff Nurses And Patient Safety", which was published in the July/August issue of Health Affairs6

This study found that the risk of making an error was three times higher when nurses had to work shifts that were longer than 12 hours, when they worked significant overtime or when they worked more than 40 hours in a week. Working overtime increased the odds of making at least one error, regardless of how long the shift was originally scheduled. Fatigue related to working overtime was identified as the cause of approximately 12% of the absences reported by a random sample of Canadian staff nurses.

This reported outcome reinforced the findings of the 2003 Institute of Medicine Report, "Keeping Patients Safe: Transforming the Work Environment of Nurses" (7), which also said that nurses' long working hours pose a serious threat to patient safety.

...And Because We Are Losing Nurses

Mandatory overtime is one of the main reasons nurses leave nursing. Recent studies indicate that one in five nurses are considering leaving nursing. When polled on their reasons for leaving, mandatory overtime is always listed in the top ten reasons. In the face of a severe nursing shortage, we need to keep nurses at the bedside.

Surveys have shown that the exodus of registered nurses, therapists, technologists, technicians and service and maintenance workers is directly attributable to difficult working conditions, including inadequate staffing, mandatory overtime and insufficient compensation. This is not expected to improve over the next decade because as well as leaving the bedside, much fewer numbers of people are looking to nursing as a career.

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5 Safe Nursing and Patient Care Act of 2003 (Introduced in Senate) [S.373.IS]
Safe Nursing and Patient Care Act of 2003 (Introduced in House)[H.R.745.IH]
http://thomas.loc.gov/cgi-bin/thomas

6 . Available for purchase at http://www.healthaffairs.org/ .

7 http://www.iom.edu/project.asp?id=4671

In Addition, It is Impacting the Nurses' Health

Mandatory overtime has also been associated with unhealthy weight gain, increased use of alcohol and tobacco and lower levels of functional ability and job performance. The effect on family life is harder to quantify, but may be even worse. Many healthcare workers who are forced to work mandatory overtime say that the time away from their families has cause marital and child care problems and a general decline in the emotional well-being of the family. Mandatory overtime strongly affects workers' relationships with spouses, children and friends.

Where Should the Burden of Proof Lie?

The burden of proof should be on the health care industry to show that the current system of not restricting the hours health care professionals can work is safe. The Patient Safety Foundation has a statement of principle on its Web site that states that "[e]very health care institution has an ethical obligation to protect the safety of patients by providing staff in sufficient numbers and with adequate skills to deliver quality care."

Dennis O'Leary, president of the Joint Commission on Accreditation of Healthcare Organizations, in his testimony to the US Senate, 8, outlined strategies he believes are crucial to a "true culture of safety," including creating a blame-free environment, reinforcing the systems approach to prevent medical errors, investing in information infrastructure, establishing performance incentives and enacting patient safety legislation. He also noted in his testimony that "health care professionals who work under continuous high stress will make errors." 9 The JCAHO Report on adverse conditions faced by nurses (including mandatory overtime) refers to nurses as "canaries in a coal mine."10

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8 See: U.S. Congress. Senate. Committee on Governmental Affairs. Patient safety: instilling hospitals with a culture of continuous improvement. Washington, DC. 107th Cong, 2nd Sess; 2003. Available at: http://www.senate.gov/~gov_affairs/061103witnesspsi.htm, accessed 6/3/2003

Testimonies given before the Permanent Subcommittee on Investigations on June 11, 2003. Witnesses were: Goeltz, Bagian of the VA, O'Leary of JCAHO, Clancy of AHRQ, Page of Fairview, Krawisz of NPSF, Mandernach of Minnesota DoH, and Delbanco of Leapfrog Code: ADM; GEN / CA: 2003 Jun 1

9 see
http://www.jcaho.org/about+us/public+policy+initiatives/health+care+at+the+crossroads.pdf
10 ibid. page 47

Retaliation by Employers

Nurses do suffer retaliation from employers for refusing to accept overtime hours. There are reports from all over the country. According to a report, The Minnesota Nurses Association has documented complaints from nurses who were threatened by their employer. These nurses were told that if they would not work additional shifts, they would be reported to the State Board of Nursing for "patient abandonment". While the Board does not view the refusal to accept additional shifts because of fatigue as "patient abandonment", the fear of such a complaint often compels nurses to work against their better judgment. Another form of retaliation is more direct and involves simply firing or suspending the nurse who refuses overtime. In this situation, the nurse is forced to choose between their ethical obligation to the patient to provide quality care and their livelihood. This is a choice that nurses should not have to make.

What is this term ABANDONMENT?

According to the New Jersey Board of Nursing, the term "patient abandonment" should be differentiated from the term "employment abandonment," which becomes a matter of the employer-employee relationship and not that of the Board of Nursing. It should be noted that from a regulatory perspective, in order for patient abandonment to occur, the nurse must have first accepted the patient assignment and established a nurse-patient relationship, then severed that nurse-patient relationship without giving reasonable notice to the appropriate person (supervisor, employer) so that arrangements can be made for continuation of nursing care by others. Providing appropriate nursing personnel to care for patients is the responsibility of the employer. Failure of a nurse to work beyond his/her scheduled shift, refusal to accept an assignment, refusal to float to another unit, refusal to report to work, and resigning without notice are examples of employment issues and not considered by the New Jersey Board to constitute patient abandonment.

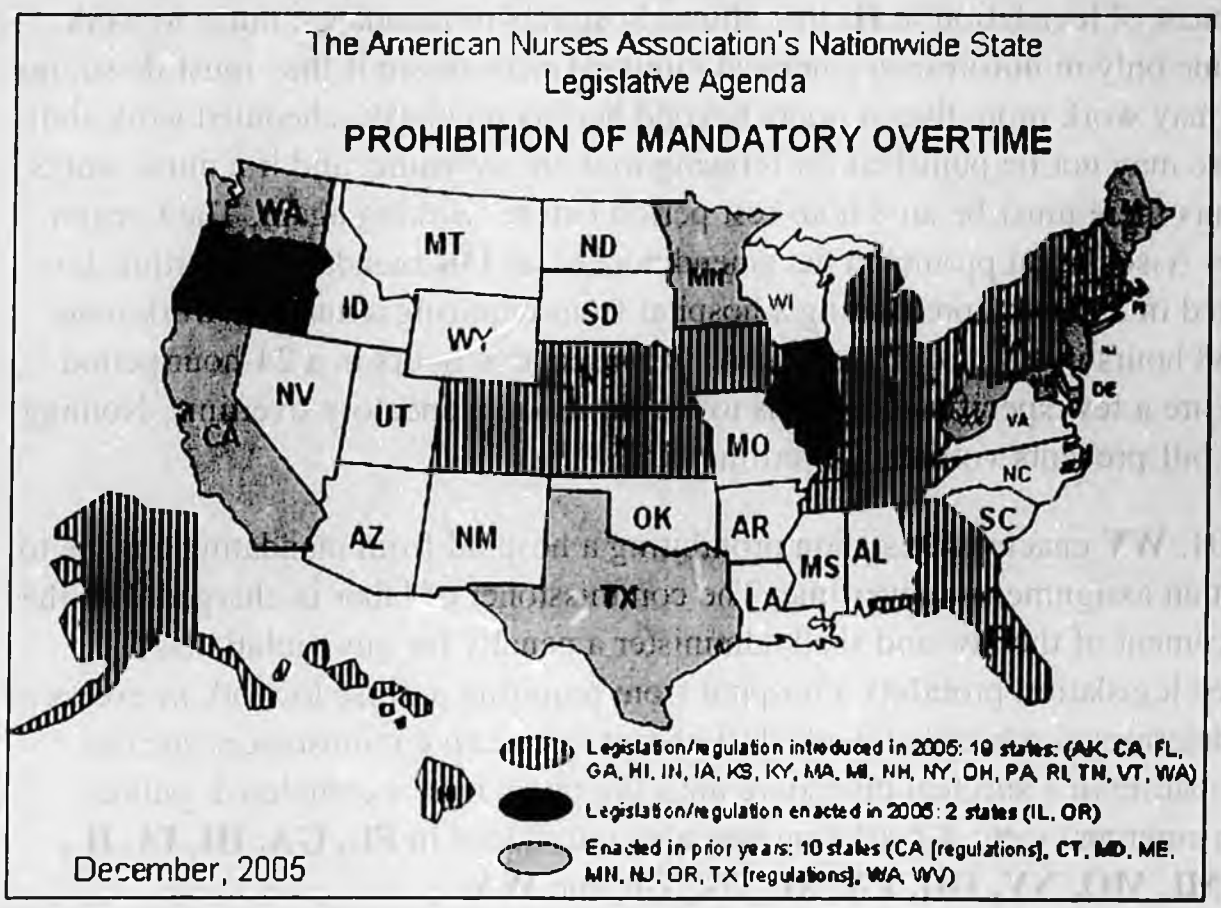
What are other states doing?

In 2003, three states, LA, NV and WV enacted legislation requiring the establishment of study committees to further explore the issue. 22 other states introduced prohibition of mandatory overtime legislation/regulation designed to set maximum hours of work per day/week with protected right of refusal for work time requested in excess of predetermined maximums.

Approximately 28+ states have completed or initiated steps toward legislation to restrict mandatory overtime for RNs, LPNs and, in some cases, all health care workers. In 2004, WV enacted legislation prohibiting a hospital from mandating a nurse to accept an assignment of overtime. CT enacted legislation that prohibits a hospital from requiring a nurse to work in excess of a predetermined scheduled work shift except in certain circumstances (emergency etc). Legislation was also introduced in FL, GA, HI, IA, IL, MA, MI, MO, NY, OH, PA, RI, TN, VT, and WA.

ANA State Government Relations

2005 Legislation: Mandatory Overtime (updated 12/05)



Background: Mandatory Overtime

Mandatory overtime is a difficult problem for RNs and health care facilities. Because of inadequate RN staffing, employers have used mandatory overtime to staff facilities often as a cost savings factor. Nurses are concerned about the health effects of long term overtime and the quality of care being provided. Research indicates that risks of making an error were significantly increased when work shifts were longer than 12 hours, when nurses worked overtime, or when they worked more than 40 hours per week[1].

As part of the American Nurses Association's (ANA) Nationwide State Legislative Agenda on the nurse staffing crisis, State Nurses Associations support the enactment of mandatory overtime legislation in state legislatures and regulatory agencies. ANA is also pursuing the enactment of federal legislation to prohibit mandatory overtime. The Safe Nursing and Patient Care Act of 2005 (HR

.791/S 351) www.anapoliticalpower.org has been introduced in the House and Senate and would prohibit the requirement that a nurse work more than 12 hours in a 24 hour period and 80 hours in a consecutive 14 day period, except under certain circumstances.

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In 2003, three states, **LA, NV** and **WV**, enacted legislation requiring the establishment of study committees to further explore the issue. 22 other states introduced prohibition of mandatory overtime legislation/regulation designed to set maximum hours of work per day/week with protected right of refusal for work time requested in excess of predetermined maximums.

In 2002, the following states enacted prohibition of mandatory overtime legislation: **MD** law states that an employer may not require a nurse to work more than the regularly scheduled hours according the predetermined work schedule. There are some exceptions including an emergency situation that could not be reasonably anticipated and if a nurse has critical skills and expertise that are required for the work. **MN** law prohibits action against a nurse who refuses mandatory overtime because it would jeopardize patient safety. **NJ** enacted legislation prevents a health care facility from requiring an employee to work in excess of an agreed to, predetermined and regularly scheduled daily work shift,

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Legislation enacted in 2001 in **ME** would prevent a nurse from being disciplined for refusing to work more than 12 consecutive hours except in certain circumstances and must be given 10 consecutive hours off following overtime. **OR** enacted legislation prevents a nurse from being required to work more than 2 hours beyond a regularly scheduled shift or 16 hours in a 24 hour time period. Regulations adopted in **CA** prior to 2001 prevent an employee scheduled to work a 12 hour shift from working more than 12 hours in a 24 hour period except in a health care emergency.

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AACN Public Policy

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Mandatory Overtime

A Statement from The American Association of Critical-Care Nurses (AACN)

BACKGROUND

Mandatory overtime is identified as a workplace issue and a patient safety issue. Mandatory overtime is the practice of hospitals and health care institutions to maintain adequate numbers of staff nurses through forced overtime, usually with a total of twelve to sixteen hours worked, with as little as one hour's notice. With mandatory overtime nurses are unable to refuse the required extra hours due to 1) fatigue, or 2) feeling that she/he would be unable to deliver adequate, safe patient care. This does not include overtime mandated in an unforeseen emergency, such as a mass casualty situation, or a sudden snowstorm. "On call" time is not included in this definition, unless the nurse's on call time is immediately before or after a scheduled shift, and it would force him or her to work a double shift.

THE ISSUE

The dramatic changes in the health care environment that have impacted nursing practice in recent years have come as managed care programs grew in dominance and federal Medicare and Medicaid reimbursements declined (Berens, M.J.). With the nursing shortage continuing, the growing trend is for hospitals to use mandatory overtime as a common staffing practice (ANA, June 2000).

Mandatory overtime may cause or lead to increased stress on the job, less patient comfort and mental and physical fatigue that can contribute to errors and "near-misses" with medications and case-related procedures. This is occurring as patient acuity has increased. The practice of mandatory overtime ignores the responsibilities nurses may have at home with children, other family members, or other obligations. Being forced into excessive overtime can cause an exhausted

[redacted] licensure status. Impact is felt at the level of the bedside nurse in three major areas identified through current literature: medication errors, quality patient care, and nurses' legal liability.

Medication Errors - The Institute of Medicine's report *To Err is Human: Building a Safer Health System* (IOM, 12/1999) states the deaths from medication errors that take place both in and out of hospitals, more than 7000 annually, exceed those from workplace injuries. In a separate report, investigation by the Chicago-Tribune states that since 1995, at least 1,720 hospital patients have died and 9,548 others have been injured because of mistakes made by RN's across the country (Associated Press, 9/10/2000).

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Legal Liability - Nurses practice under each state's Nurse Practice Act, which govern nursing practice. Most nurse practice acts state that nurses are held accountable for the safety of their patients. Thus, if a nurse accepts a patient assignment and something untoward happens to that patient, the nurse is liable under her license. Once a nurse accepts an assignment, her license can be in jeopardy if she is unable to deliver safe patient care.

Implications of Change - If mandatory overtime is legally banned in all states, hospitals and health care institutions will have to look at real remedies for understaffed facilities such as:
1) Hiring more RN's, and
2) Utilizing strategies to recruit and retain more nurses.

ANA's recent study, *Nurse Staffing and Patient Outcomes in the Inpatient Hospital Setting* (3/2000), tracks five adverse outcomes measures that can be mitigated if adequate patient staffing is provided: hospital length of stay, nosocomial pneumonia, postoperative infections, pressure ulcers, and nosocomial urinary tract infections. With sufficient nurse staffing, time is available for more thorough patient assessment and interventions to improve outcomes.

The American Academy of Nursing (AAN) conducted research in the 80's, which has had several follow-up studies since, which reinforce the original findings of researcher Linda Aiken. Her research affirmed that specific organizational variables create a milieu that not only attracts nurses, but also create practice environments that provide better outcomes for patients. "Magnet facilities" have higher nurse-staffing levels, and lower mortality and morbidity rates, shorter length of stay, and lower utilization of ICU days. In the 1999 follow-up research,

a lower incidence of needlestick injuries among nurses was also noted. If mandatory overtime is allowed to continue, one could easily project:

1) Increase in medication errors,
2) Decrease in safe, quality patient care,
3) Decrease in patient satisfaction,
4) Increase in hospital length of stay,
5) Increase in mortality and morbidity,
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7) Decrease in retention of nurses, and
8) Increase in legal liability issues against nurses.

LEGISLATIVE HISTORY

February 12, 2003 - Senator Edward M Kennedy re-introduced **S. 373, the Safe Nursing and Patient Care Act of 2003**, which amends title XVIII of the Social Security Act to provide for patient protection by limiting the number of mandatory overtime hours a nurse may be required to work in certain providers of services to which payments are made under the Medicare program. A companion bill, H.R. 745 was again re-introduced in the House by Representative Pete Stark. The bills are currently in committee.

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September 15, 2000- H.R. 5179 "The Registered Nurses and Patients Protection Act" was introduced into the U.S. House of Representatives by Rep.Tom Lantos (D-Calif.). The bill would amend the Fair Labor Standards Act so that no RN would be required to work beyond eight hours in any workday or 80 hours in any 14-day work period. This legislation was not acted on in the 106th Congress and Lantos reintroduced the bill **(H.R. 1289)** in the 107th Congress where it was referred to the House Committee on Education and the Workforce and to the Subcommittee on Workforce Protections.

AACN's POSITION

AACN believes that mandatory overtime is not an acceptable means of staffing a hospital, because it may place nurses and their patients at increased risk of being involved in medical errors. Instead, nurses should be able to decide whether working overtime will affect their ability to care safely and effectively for patients. They should have the option of refusing overtime assignments and not be forced into working beyond their capacity to provide optimal care. AACN supports this legislation and will continue to work to educate the public on the negative impact that mandatory overtime can have on patient safety.

WHAT YOU CAN DO

Work with the administrators in your facility to develop systems that support the delivery of quality care and a safe work environment.

Let your legislators know that this bill has strong support of nurses. Discuss with him or her:

Your concern that mandatory overtime is not an acceptable means of staffing a hospital because it can place nurses and their patients at increased risk for making errors.

The fact that studies have shown that when a worker (especially a health care worker) exceeds 12 hours of work, and is fatigued, the likelihood of their making an error increases. The IOM report on medication errors substantiates these findings, where the experts who compiled the report specifically recommended that safe staffing and limits on mandatory overtime are a component to preventing medication errors.

Explain RN accountability for the delivery of safe care and that nurses should not be forced into working beyond his or her capacity to provide optimal care without the right to refuse that assignment.

3/01

Revised 3/03

American Association of Critical-Care Nurses

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AACN*Public Policy*

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February 10, 2005

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ANA Applauds Bill Prohibiting Use of Forced Overtime Among Nurses

U.S. House of Representatives measure would ensure safer patient care, greater protections for RNs

Silver Spring, MD - The American Nurses Association (ANA) today hailed the Safe Nursing and Patient Care Act of 2005, a bill introduced by Rep. Pete Stark (D-CA) and Rep. Steven LaTourette (R-OH) that would strictly limit the practice of forcing nurses to work overtime.

The proposed legislation would address the current nurse staffing crisis in the U.S. by strictly limiting mandatory overtime among nurses, a dangerous practice that has contributed to a recent exodus of nurses from the nation's hospitals and a decline in safe, quality patient care. ANA has been at the forefront of the push for this legislation and worked collaboratively on its development with members of Congress and other organizations representing nurses.

"Study after study has shown that the use of forced overtime among nurses endangers nurses and their patients," said ANA President Barbara Blakeney, MS, RN. "The Safe Nursing and Patient Care Act would prevent health care facilities from forcing exhausted nurses to work extra shifts, an unsafe practice that puts both patients and nurses at risk," she added.

As evidence, Blakeney pointed to "The Working Hours of Hospital Staff Nurses and Patient Safety," a study published in the July/August 2004 issue of *Health Affairs*, which found that the risk of making an error greatly increased when nurses worked shifts longer than 12 hours, when they worked significant overtime or when they worked more than 40 hours per week. This study reinforced findings of the 2003 Institute of Medicine Report, "Keeping Patients Safe: Transforming the Work Environment of Nurses," which found that nurses' long working hours pose a serious threat to patient safety.

If passed, the Safe Nursing and Patient Care Act would:

- Prohibit health care facilities that receive Medicare funding from requiring a registered nurse (RN) or licensed practical nurse (LPN) to work beyond an agreed to, predetermined, regularly scheduled shift. In no instance could a nurse be required to work more than 12 hours in a 24-hour period or for more than 80 hours in a two-week period.

- Include nondiscrimination protections for nurses who refuse overtime and for nurses who provide information and/or cooperate with investigations about the use of overtime.

- Include an exception in the case of a declared national, state or local emergency. Such an

emergency would be in response to a disaster, not to a staffing deficiency resulting from management practices.

- Provide for a study by the Department of Health and Human Services on the maximum number of hours that may be worked by a nurse without compromising patient safety.

The ANA has warned that mandatory overtime is dangerous for patients and nurses, and that the practice is exacerbating a growing nursing shortage that is expected to worsen dramatically over the next 10 years.

To counter staffing insufficiencies that are already occurring, many health care facilities have increasingly imposed mandatory overtime. Typically, an employer may insist that a nurse work an extra shift (or more) or face dismissal for insubordination, as well as being reported to the state board of nursing for patient abandonment, a charge that could lead to a loss of license. At the same time, ethical nursing practice prohibits nurses from engaging in behavior they know could harm patients, thus leading to a dilemma for many nurses.

"The good news is that we have had some success in prohibiting forced overtime at the state level," Blakeney noted. "So far, 10 states - California, Connecticut, Maine, Maryland, Minnesota, New Jersey, Oregon, Texas, Washington and West Virginia - have either banned or severely limited the use of mandatory overtime, and similar measures have been introduced in 15 other states. But because the trend of forced overtime amongst nurses is such a significant threat to patients' and nurses' safety, we must protect nurses across the nation. That is why we have called on Congress to protect the public by taking federal action."

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The American Nurses Association is the only full-service professional organization representing the nation's 2.7 million Registered Nurses (RNs) through its 54 constituent member associations. The ANA advances the nursing profession by fostering high standards of nursing practice, promoting the economic and general welfare of nurses in the workplace, projecting a positive and realistic view of nursing, and by lobbying the Congress and regulatory agencies on health care issues affecting nurses and the public.

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Mandatory Overtime

Background

Mandatory overtime is a difficult problem for RNs and health care facilities. Because of inadequate RN staffing, employers have used mandatory overtime to staff facilities often as a cost savings factor. Nurses are concerned about the health effects of long term overtime and the quality of care being provided. Research indicates that risks of making an error were significantly increased when work shifts were longer than 12 hours, when nurses worked overtime, or when they worked more than 40 hours per week[1].

As part of the American Nurses Association's (ANA) Nationwide State Legislative Agenda on the nurse staffing crisis, State Nurses Associations support the enactment of mandatory overtime legislation in state legislatures and regulatory agencies. ANA is also pursuing the enactment of federal legislation to prohibit mandatory overtime. The Safe Nursing and Patient Care Act of 2005 (HR 791/S 351) www.anapoliticalpower.org has been introduced in the House and Senate and would prohibit the requirement that a nurse work more than 12 hours in a 24 hour period and 80 hours in a consecutive 14 day period, except under certain circumstances.

Activities / Actions

In 2006, hours-worked legislation was introduced in AK, CA, DC, FL, GA, HI, IA, IL, KS, MA, MI, MN, MO, NH, NY, OH, PA, RI, TN, VT, WV, and WI, none of which passed to date.

In 2005, legislation to prohibit mandatory overtime was enacted in IL and OR law was amended. The Illinois Nurses Association was instrumental in the enactment of legislation in IL that allows hospitals to mandate a nurse to work overtime only in unforeseen emergent circumstances. Even if they must do so, no nurse may work more than 4 hours beyond her/his regularly scheduled work shift. A nurse may not be punished for refusing to work overtime, and if a nurse works 12 hours there must be an 8 hour rest period before working again. The Oregon Nurses Association promoted the amendment of an OR mandatory overtime law (enacted in 2001) by prohibiting a hospital from requiring a nurse to work more than 48 hours in a week or more than 12 consecutive hours in a 24-hour period. There are a few specific exceptions to the limits on mandatory overtime. Nothing in the bill prevents voluntary overtime.

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Staff RNs work hours and errors/near errors

A major study done on Staff Registered Nurses' work hours and errors and near errors in the acute care setting has just been published in the July/August 2004 issue of the journal *Health Affairs*. You may access the article at www.healthaffairs.org, under Datawatch, or through a library. The complete citation is listed below. This summary of the article is being sent to the Constituent Member Associations (CMA) in anticipation that news agencies will seek comments from CMA leaders. If you have any questions about the study or its implications, do not hesitate to contact Patricia Rowell, RN, PhD, Senior Policy Fellow, Department of Nursing Practice and Policy at 202-651-7058.

A Review of Research Findings

Rogers, A.E., Hwang, W., Scott, L.D., Aiken, L.H. and Dinges, D.F. (2004). The working hours of hospital staff nurses and patient safety". *Health Affairs*, 23, 202-212.

The July/August issue of *Health Affairs* has published the study, "Working hours of hospital staff nurses and patient safety", by Ann E. Rogers, et al. This study, funded by the Agency for Healthcare Research and Quality (AHRQ), has been supported by the American Nurses Association (ANA) through its assistance to Dr. Rogers and her team in obtaining ANA members to serve as research subjects. This article reports on one part of the research but most importantly that part that discusses findings from ANA members. The 393 members who participated have contributed to a very important study for nursing.

This study's sample size and the research design are good, therefore, lending credence to the study.

The importance of this part of the study lays in its documentation of long working hours as the norm; rates of errors and near errors; and the relationship between these two conditions. The following are the major findings:

- "The likelihood of making an error increased with longer work hours and was three times higher when nurses worked shifts lasting 12.5 hours or more." (p.206)
- "Working overtime increased the odds of making at least one error, regardless of how long the shift was originally scheduled." (p.206)
- "...there is a trend for increasing risks when nurses work overtime after longer shifts with the risks being significantly elevated for overtime following a twelve hour shift." (p.207)
- "...working more than forty hours per week and more than fifty hours per week significantly increased the risk of making an error." (p.207)
- "...work schedules of hospital staff nurses are unpredictably prolonged." (p.207)
- "...double shifts (or longer) are not confined to rare emergencies." (p. 207)

- "Although the occurrence of errors did not increase significantly until shift durations exceeded 12.5 hours per day, risks began to increase when shift durations exceeded 8.5 hours." (p. 208)
- "The long and unpredictable hours documented here suggest a link between poor working conditions and threats to patient safety." (p. 210)

Authors' recommendations:

- "Because more than three-fourths of the shifts scheduled for twelve hours exceeded that time frame, routine use of twelve-hour shifts should be curtailed and overtime-especially that associated with twelve-hour shifts-should be eliminated." (p.210)

It should be noted that this study's findings are similar to those of similar studies with other work groups (e.g., pilots, air traffic controllers, resident physicians, etc.). The underlying concept that, regardless of profession, human physiology limits how long a person can function and be safe, must be attended to.

Par:/products/Rogers'Art704
7/7/04

contact Dr. Wilder
contact ALPA - exec. committee

2.2, 5.4, and 6.3).

- The American Nurses Association maintains the deterioration in working conditions for nurses is the primary cause of staff vacancies being reported by hospitals and nursing facilities – not a systemic nursing shortage. In fact, data from the Health Resources and Services Administration's (HRSA) 2000 national sample survey of RNs show that more than 500,000 licensed nurses have chosen not to work in nursing. This available labor pool could be drawn back into nursing if they found the employment opportunities attractive enough.

- Governmental standards have been established to place limits on that amount of time that can be worked in aviation, railroads, and trucking. No requirements exist for nurses who care for those who are ill and most vulnerable.

- Legislators across the country are responding to constituents concerns regarding the devastating effects of mandatory overtime. In 2001 alone, 16 states introduced legislation to prohibit mandatory overtime, while legislation was enacted in Oregon and Maine.

- While stress can be quantified, fatigue cannot. Numerous factors and conditions including individual physiology, nutrition, age, experience and work complexity levels must be considered when evaluating fatigue. Academicians have not yet developed a clear or precise formula for determine when fatigue affects work performance. For this reason, determination of fatigue has and continues to remain highly subjective. Nurses must be allowed to use their personal and professional judgment to determine their own fatigue levels and its impact on quality of care.

Talking Points on Mandatory Overtime

The American Nurses Association and the Alaska Nurses Association support legislation to prevent employers from requiring nurses to work mandatory overtime.

- Mandatory overtime is defined as work hours imposed on a nurse in excess of an agreed upon, predetermined work schedule. It does not include an unforeseen declared national, state or municipal emergency or disaster.

- Poor working conditions are driving nurses away from the bedside. Since the proliferation of managed care and the cost containment strategies of the 1990's, nursing staffs have been dramatically cut. Nurses are caring for greater numbers of patients than ever before who are sicker than in the past. To make matters worse, more and more hospitals are forcing nurses to work overtime.

- Nurses are reporting a dramatic increase in the use of mandatory overtime. According to a 2001 American Nurses Association survey of 5,000 nurses from across the country, over two-thirds of nurses work mandatory or unplanned overtime. Mandatory overtime is having a negative impact on quality of patient care, working conditions and the bottom line.

- The use of mandatory overtime is a bad business practice. Lack of control over one's work and schedule results in high stress levels according to the National Institute for Occupational Safety and Health (NIOSH). Job stress is detrimental to an employee's health and has been linked to cardiovascular disease, muscle and skeletal disorders, depression and burnout. It leads to unsafe patient care. According to the American Institute of Stress, 60 to 80% of industrial accidents are due to stress. In addition, job stress costs U.S. industry $300 billion annually through absenteeism, employee turnover, insurance fees and diminished productivity.

- Nurses, as professionals licensed by the state, have the autonomy to determine how their work will be performed and are responsible for that work. This mandate is articulated in the Nurse Practice Act and enforced by the Board of Nursing. These professional obligations are undermined when a nurse is forced to work mandatory overtime. Nurses who challenge employers by exerting professional and ethical judgements are likely to be terminated. Since nurses have few avenues to challenge mandatory overtime and could face licensure censure or revocation for providing less than adequate care because of stress, legislators must step in to protect the professional judgement of nurses and protect their patient's right to safe, quality care.

- Mandatory overtime is unethical because it violates a nurses duties and obligations to herself, society and professional practice. It directly undermines professional nursing practice by creating situations where harm can occur to both patients and nurses resulting in moral distress for the nurse. Mandatory overtime eliminates professional judgement and autonomy while still requiring professional accountability. Several provisions in the *Code of Ethics for Nurses* speak directly to this as an unethical practice. (See sections

The impact of overtime and long work hours on occupational injuries and illnesses: new evidence from the United States

A E Dembe, J B Erickson, R G Delbos and S M Banks

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ORIGINAL ARTICLE

The impact of overtime and long work hours on occupational injuries and illnesses: new evidence from the United States

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Aims: To analyse the impact of overtime and extended working hours on the risk of occupational injuries and illnesses among a nationally representative sample of working adults from the United States.

Methods: Responses from 10 793 Americans participating in the National Longitudinal Survey of Youth (NLSY) were used to evaluate workers' job histories, work schedules, and occurrence of occupational injury and illness between 1987 and 2000. A total of 110 236 job records were analysed, encompassing 89 729 person-years of accumulated working time. Aggregated incidence rates in each of five exposure categories were calculated for each NLSY survey period. Multivariate analytical techniques were used to estimate the relative risk of long working hours per day, extended hours per week, long commute times, and overtime schedules on reporting a work related injury or illness, after adjusting for age, gender, occupation, industry, and region.

Results: After adjusting for those factors, working in jobs with overtime schedules was associated with a 61% higher injury hazard rate compared to jobs without overtime. Working at least 12 hours per day was associated with a 37% increased hazard rate and working at least 60 hours per week was associated with a 23% increased hazard rate. A strong dose-response effect was observed, with the injury rate (per 100 accumulated worker-years in a particular schedule) increasing in correspondence to the number of hours per day (or per week) in the workers' customary schedule.

Conclusions: Results suggest that job schedules with long working hours are not more risky merely because they are concentrated in inherently hazardous industries or occupations, or because people working long hours spend more total time "at risk" for a work injury. Strategies to prevent work injuries should consider changes in scheduling practices, job redesign, and health protection programmes for people working in jobs involving overtime and extended hours.

A growing body of evidence suggests that long working hours adversely affect the health and wellbeing of workers. Studies have associated overtime and extended work schedules with an increased risk of hypertension,[1 2] cardiovascular disease,[3–9] fatigue,[1 10–13] stress,[14–17] depression,[18 19–20] musculoskeletal disorders,[21–23] chronic infections,[24] diabetes,[25] general health complaints,[26–28] and all-cause mortality.[29] Several reviews and meta-analyses have been published summarising these research findings.[30–34] Systematic reviews generally have concluded that long working hours are potentially dangerous to workers' health. However, existing research is sparse and inconsistent in many areas.

Comparatively few studies have examined the impact of long work hours on workers' risk for occupational injuries and illnesses. Some studies have detected evidence of a relation between long working hours and an increased risk of occupational injuries among workers in specific occupations and industries, including construction workers,[35] nurses,[36] anaesthetists,[37] veterinarians,[42] other healthcare professionals,[43 44] miners,[45] bus drivers,[46] long distance truck drivers,[47] fire-fighters,[48] and nuclear power plant workers.[49] In one of the only studies involving the manufacturing sector, an increased risk of severe hand injuries was found for Hong Kong factory workers working more than 11.5 hours per day.[50] A large scale cross-industry study of 1.2 million German workers' compensation records found that the risks of non-fatal and fatal workplace accidents increase during the latter portion (after the eighth hour) of a long work shift.[51 52] Similar findings of an increased risk of work injuries during the latter portion of long shifts has also been observed in studies from Scandinavia and the United Kingdom.[53 54] Other researchers have investigated the affect of successive long shifts and the length of rest breaks between shifts as possible risk determinants for industrial accidents.[55]

Nevertheless, researchers' understanding of the impact of long working hours on workplace injuries remains incomplete and equivocal. Several investigations have found no evidence of an association,[56–59] or have observed a protective effect.[60 61] Authorities have noted that many existing studies have serious methodological shortcomings, including small sample sizes, unique industry specific circumstances that limit generalisability of the findings, and the failure to account for potential confounding factors. For example, jobs performed during long working shifts might be inherently more dangerous, or people working in extended-hour schedules might have different personal characteristics (for example, age, gender, or underlying health status) that affect their injury risk. Additionally, the vast majority of existing studies have been performed in Europe, Asia, and Scandinavia. Or ly a handful of studies have been conducted in the United States, and none of them have involved large sample sizes or study populations representing a mix of industries and occupations.

This article reports on a study of the impact of overtime and extended working hours on the risk of occupational injuries and illnesses among a nationally representative sample of working adults from the United States. The study spans 13 years and draws on information contained in 110 236 job records. Multivariate analyses are employed to

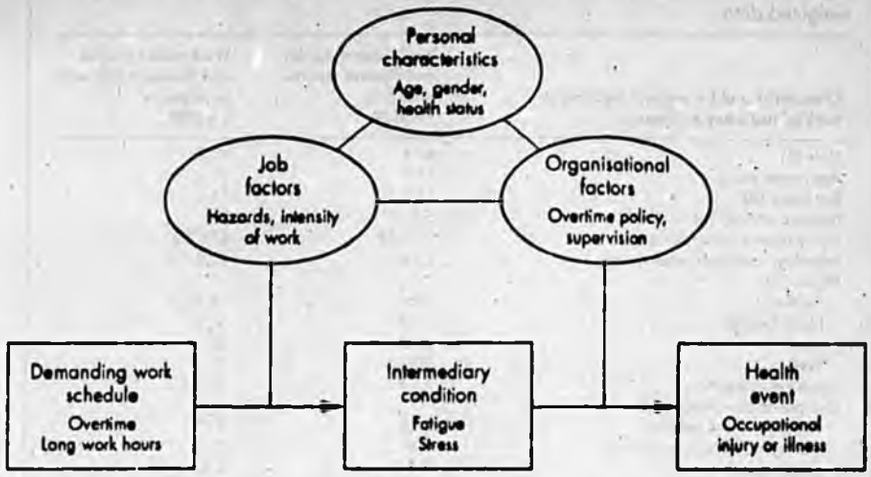

Figure 1 Conceptual model of the relationship between demanding work schedules and occupational injuries and illnesses (adapted from Schuster and Rhodes[42]).

control for the influence of workers' age and gender, region, industry sector, and occupation. The study is based on the hypothesis that working overtime or an extended work schedule increases the likelihood of reporting an occupational injury or illness compared to workers having less demanding schedules. Moreover, we hypothesise that the risk of injury increases with increasing volume of work performed in the demanding schedule.

The conceptual basis for this study is adapted from a theoretical model proposed by Michel Shuster and Susan Rhodes in 1985.[42] In this model, overtime and long hours of work are presumed to affect the risk of workplace accidents by precipitating various intermediary conditions in affected workers, such as fatigue, stress, and drowsiness. The pathway linking a demanding work schedule to the intermediary condition and ultimately to a workplace accident can be mediated by a variety of individual and environmental factors, including personal characteristics (for example, age, gender, health status, job experience), job factors (for example, intensity of work, exposure to hazards), and organisational factors (for example, overtime policy, supervision) (see fig 1). Our study analyses the association between exposure to overtime and extended work schedules and the incidence of reported work related injuries and illnesses, adjusting for the influence of several mediating factors, including age, gender, occupation, industry sector, and geographical region. The specific mechanisms by which fatigue, stress, or other intermediary conditions bring about a workplace accident are not investigated in this report.

METHODS

Data for this study comes from the National Longitudinal Survey of Youth (NLSY), which is sponsored by the US Bureau of Labor Statistics and administered by the Ohio State University Center for Human Resource Research.[43] The NLSY cohort is comprised of 12 686 men and women who were 14–22 years of age when first surveyed in 1979. Follow up interviews with NLSY respondents have been conducted annually from 1979 to 1994, and biannually since 1996. Because of NLSY funding restraints, no questions concerning work related incidents were included in the 1991 survey and therefore this year of data was excluded.

The NLSY collects information on respondents' socio-demographic characteristics, household composition, education, training, detailed work histories, job and employer characteristics, income and assets, health insurance status, incidence of work related injuries and illnesses, episodes of work disability, and respondents' social and domestic functioning. The survey's sampling strategy was designed to be representative of the non-institutionalised civilian segment of young people living in the United States in 1979 and born between 1 January 1957 and 31 December 1964.[44] Additionally, NLSY over-sampled civilian Hispanic, black, and economically disadvantaged white youth to help detect variations in employment and health conditions according to respondents' race, ethnicity, and socioeconomic status. Subjects for the survey were selected based on the results of 57 000 household screening interviews conducted by the National Opinion Research Center (NORC) at the University of Chicago.[45] NLSY provides sampling weights for each response to reflect the national distribution of Americans in this age range.

This study examined the experience of these individuals between 1987 and 2000. Attempts were made to re-interview every remaining cohort member at each survey. Survey response rates for those years (excluding deceased respondents) ranged from 91.0% for the 1988 survey to a high of 92.5% in 1989 and a low of 83.4% in 2000. During that period, 10 793 members of the cohort reported working in at least one job. Among employed cohort members, 52.2% were male, 13.2% were black, and 6.7% were of Hispanic ethnicity (weighted percentages). A job record was created for each position held by an individual during each survey period, with a "job" defined as a cohort member being employed in a particular position for a specific employer with a position start date and (if applicable) end date provided. If an individual held more than one position at a time (for example, for different employers), another job record was created to reflect the individual's experiences in the positions held concurrently. Changes occurring within a position (for example, changes in job activities) did not result in the creation of a new job history record, but a new record was created when a worker changed positions (for example, a machinist becoming a supervisor). A total of 110 236 job records were available for analysis, encompassing a total of 89 729 person-years of accumulated working time. Each job record contained extensive self-reported information about the characteristics of the job including the date of beginning work in the job, the end date (if applicable), job responsibilities and activities, occupational category, employer's industry sector, job location, customary work schedule, usual daily job starting and ending times, commuting time, and

Table 1 Characteristics of the workers reporting work related injuries and illnesses, weighted data

Characteristics of the workers reporting a work related injury or illness	Work related injuries and illnesses reported in all jobs n = 5139	Work related injuries and illnesses in jobs with an exposure* n = 2799
Male (%)	61.1	67.7
Age (mean years)	31.7	32.3
Black race (%)	11.2	11.2
Hispanic ethnicity (%)	6.8	7.0
Family income (mean dollars)	$33419	$35502
Schooling completed (mean years)	12.6	12.6
Region (%)		
Northeast	16.6	16.9
North Central	31.0	31.6
South	31.8	32.4
West	20.6	19.1
Urban residence (%)	27.4	29.5
Occupation classification (%)		
Professional and technical	11.0	9.7
Managers, officials, proprietors	9.8	10.5
Sales workers	2.4	2.5
Clerical	11.1	9.4
Craftsmen, foreman	19.6	17.6
Machine operators	20.0	22.6
Labourers, except farm	9.3	9.0
Service workers	15.1	16.5
Other	1.7	2.2
Industry classification (%)		
Agriculture, forestry, and fisheries	3.7	3.7
Mining	1.1	1.7
Construction	11.6	9.8
Manufacturing	23.3	25.5
Transportation and communication	7.7	8.6
Wholesale and retail trade	18.5	18.7
Finance, insurance, real estate	2.2	1.7
Business and repair services	6.3	6.9
Personal services	3.1	2.8
Entertainment and recreational	1.5	1.9
Professional and related services	14.6	11.6
Public administration	6.3	7.0
Worker covered by union contract	20.8	23.0
Worker dislikes the job	15.8	16.1
Annual wages (mean dollars)	$21265	$23439

Some individual workers reported more than one injury and thus their characteristics are counted more than once in this table.
*Jobs with any of the four types of exposures.

information about overtime work and the receipt of overtime pay.

For the purposes of this study, five exposure categories were specified:

- *Extended hours per week*: Jobs in which the respondent reported regularly working 60 or more hours per week were considered to have this exposure.
- *Extended hours per day*: Jobs in which the respondent reported regularly working 12 or more hours per day were considered to have this exposure.
- *Overtime*: For the 1988–93 survey years, the individual's job was considered to have this exposure if the worker responded "yes" to the question: "Did you work overtime at this job?'. The NLSY survey did not define the meaning of "overtime"; interpretation of that term was left up to the discretion of the respondent. Owing to changes in the NLSY questionnaire, from the 1994 to 2000 survey years, the individual's job was considered to have this exposure if the worker responded "yes" to the question: "At this job, did you usually receive overtime pay?'.
- *Extended commute time*: Jobs in which the respondent reported regularly commuting two or more hours per day to and from the workplace were considered to have this exposure.
- *Overtime or extended hours*: This was a derived summary exposure variable. A worker's job was considered to have this exposure if it contained any of the preceding four exposures.

The exposure categories were not mutually exclusive and so a particular job potentially could have one or more exposures.

The primary outcome of interest in this study was the self-reported incidence of a work related injury or illness. This was based on a respondent's affirmative response to the following question:

> "I would like to ask you a few questions about any injuries or illnesses you might have received or gotten while you were working on a job. Since [date of last interview] have you had an incident at any job that resulted in an injury or illness to you?"

During the 13 year study period, 5139 work related injuries and illnesses were reported. Of those, 2799 occurred in jobs having exposure to at least one of the four exposure categories. Table 1 summarises characteristics of the effected workers and their injuries. For the purposes of this analysis, we assumed that the reported injuries were independent

Table 2 Job records with reported work related injuries or illnesses that were included in the regression analysis compared to those that were excluded, weighted data

Variable	Job records included n = 4765	Job records excluded* n = 374	p value
Gender (% male)	62.6	61.8	0.78
Race (e.g. % black)	23.4	19.8	0.44
Marital status (% married)	53.2	48.7	0.08
Region (e.g. % Southern)	33.5	35.6	0.30
Urban (%)	24.2	24.3	0.94
Occupation (e.g. operatives)	22.1	21.3	0.74
Industry (e.g. % manufacturing)	23.2	24.4	0.46
Injury (e.g. % musculoskeletal)	34.0	35.6	0.16
Satisfaction (% likes job)	83.3	84.2	0.66
Age (mean)	29.3	31.3	<0.01
Family income (mean $1000s)	30.4	30.5	0.97
Family size (mean)	3.20	3.03	0.29
Education (mean years)	12.1	12.4	0.05
Salary (mean $1000s)	15.5	20.2	<0.01

*An additional 174 excluded job records containing a second or subsequent injury have not been included in this comparison because they are a subset of the included jobs.

from one another. Also, we assumed that a distinct worker may suffer more than one injury, and in that circumstance, the worker's characteristics (in table 1 and the subsequent analyses) would be counted more than once. These presumptions reflect typical patterns of acute injury occurrence and accident reporting in industrial settings. For example, it would not be uncommon for a particular worker to fall and sprain an ankle on one occasion and then subsequently (perhaps even in the same year) suffer a different injury (for example, a cut finger) without there being a specific causal connection between the two events.

Crude (unadjusted) occupational injury and illnesses incidence rates for each of the five exposure categories (for each survey period) were calculated by dividing the total number of work related injuries and illnesses reported in jobs having each type of exposure by the total accumulated person-time worked in those jobs. The crude incidence rates for each exposure category were plotted graphically for every NLSY survey year from 1988 to 2000 to depict trends over time and to visually portray the relative difference in rates between jobs with and without each type of exposure (that is, the relative rate ratio). Information about commuting time was only collected in NLSY survey years 1988, 1993, and 1994, and thus trend lines for that exposure category were not graphed.

Rate ratios, reflecting the relative risk of reporting the occurrence of an occupational injury or illness, were calculated by dividing the incidence rate for the accumulated person-time in jobs with an exposure by the incidence rate for accumulated person-time in jobs without that exposure. So, for example, in a particular survey period, if 300 injuries were reported to have occurred in jobs containing a total of 3000 person-years with an exposure and 200 injuries were reported to have occurred in jobs containing a total of 4000 person-years without that exposure, then the crude rate ratio would be 2.0, calculated as follows:

- (300 injuries/3000 exposed person-years) ÷ (200 injuries/4000 unexposed person-years) = 10.0 injuries per 100 exposed person-years ÷ 5.0 injuries per 100 unexposed person-years = rate ratio of 2.0

To adjust for the influence of selected covariates, multivariate analyses were performed to calculate hazard ratios for each exposure category using Cox proportional hazards regression techniques, which are used to analyse the effect of multiple risk factors over the time preceding the occurrence of an event. The multivariate analyses included all accumulated person-time of exposure preceding the first injury in a particular job during a survey period, disregarding subsequent injuries and associated exposure time in that job during the period. Of the total number of work related injuries reported (5313), only 174 (3.3%) were the second or subsequent injury in a job during a survey period and thus were excluded from the analyses. Other job records were excluded because of insufficient information about the specific date of injury or time spent on a job, resulting in the exclusion of an additional 370 injuries, and the absence in some records of sample weights, resulting in the exclusion of an additional four injuries (and the associated exposure time). We performed a comparison of the job records with injuries used in the regression analysis (4765) to the 374 records with missing data to determine if those included and excluded were significantly different. The 174 "subsequent injury" records were not included in this comparison because by definition they had the same job characteristics as those included in the 4765 job records with first injuries. Our comparison showed that the records excluded from the analysis were very similar to those included (table 2).

As a result of these methodological considerations, there was a total of 109 087 job records and 4765 injuries used in the Cox proportional regression analyses of hazard ratios compared to 110 236 job records and 5313 injuries used in the crude analyses of incidence rates and rate ratios. Sample weights were applied to derive nationally representative estimates for individuals in the NLSY age range (14–22 years old as of 1979; 22–43 years old during the study period from 1987 to 2000).

Each regression model included the accumulated person-time for one of the five exposure categories as the primary independent variable, the reporting of a work related injury or illness as the dependent variable, and age (continuous variable), gender (M/F), region (Northeast, South, North Central, West), occupational grouping (high risk/low risk), and industry grouping (high risk/low risk) included as covariates. "High risk" occupations included US Census (1970) Occupation Classification Codes 401–575, 601–715, and 740–785 (craftsmen, foremen, operatives, and labourers), and "high risk" industries included US Census (1970) Industrial Classification Codes 067–077 and 107–398 (construction and manufacturing sectors).[49] The occupation and industry codes selected for inclusion in the "high risk" categories have traditionally higher than average occupational injury and illness incidence rates as reported by the US Bureau of Labor Statistics.[50] We tested the proportional hazards assumption and it held for every variable used in the regression model with the sole exception of region. However,

Table 3 Types of injuries and illnesses reported by workers in jobs with and without exposure, percent distribution, weighted data

Type of injury or illness	Injuries and illnesses in jobs with an exposure n = 2799	Injuries and illnesses in jobs without exposure n = 2339
Musculoskeletal conditions	34.9	34.4
Fractures	7.8	7.4
Cuts and bruises	25.0	24.9
Burns	3.3	3.3
Other traumatic injuries	12.2	11.6
Peripheral nervous system diseases	2.8	2.7
Other occupational diseases	9.2	10.2
Miscellaneous	4.8	5.5

in our analysis, region was considered only as a potential confounder. We did not draw or report any conclusions in this study about the effect of region on the propensity for injury. Thus, based on the general applicability of the assumption for all of the primary exposure variables and the main outcomes variable (injury) used in the analyses, we applied the Cox proportional approach and reported the results accordingly.

Crude incidence rates and rate ratios were calculated with SAS (version 8.0) statistical software.[47] The ProQuest software system was used to create a database of jobs and person-time exposure records,[48] and Cox proportional regression analyses were performed on that database using Stata SE (version 7) statistical software.[49] Because the hazard ratio calculations were based on a sample rather than the NLSY's entire target universe (Americans aged 14–22 as of 1979), the results were subject to sampling error. To account for sampling effect, 95% confidence intervals around the hazard ratios were estimated by applying Taylor approximation techniques using SUDAAN (version 7.5) analytical software.[71]

RESULTS

Table 3 summarises the types of injuries and illnesses reported, among people working in jobs with and without exposure. Most reported work related conditions were either musculoskeletal disorders (34.7% of all reported injuries) or cuts and bruises (25.0%).

The unadjusted incidence rate for the entire duration of the study was 7.50 reported injuries per 100 worker-years for people in jobs with exposure to extended hours per week, 29% higher than the rate among those in jobs without exposure to extended hours per week (5.81 reported injuries per 100 worker-years). Similarly those in jobs with exposure to extended hours per day had an incidence rate 38% higher than those in jobs without that exposure (7.97 *v* 5.77 injuries per 100 worker-years), those in jobs with exposure to overtime had an incidence rate 84% higher than those in jobs without that exposure (7.49 *v* 4.06 injuries per 100 worker-years), and those in jobs with exposure to extended commute time had an incidence rate 7% lower than those in jobs without that exposure (6.90 *v* 7.46 injuries per 100 worker-years).

Incidence rates for each type of exposure varied by survey year, with a general downward trend in injury rates observed from 1988 to 2000 for all exposed and non-exposed groups (fig 2). Between 1988 and 2000, rates among the various exposure categories decreased by 54–69%. There were some fluctuations observed in the relative gap between exposed and unexposed groups during the study period, but no notable trends in the relative difference between groups over time were detected.

There was a strong positive relation observed between the magnitude of exposure for extended hours per week and extended hours per day and the corresponding injury incidence rate (fig 3). For extended hours per day, every additional five hours per week over 40 was associated with an average increase of approximately 0.7 injuries per 100 worker-hours. For extended hours per day, every additional 2 hours per day over 8 was associated with an average increase of approximately 1.2 injuries per 100 worker-hours.

Table 4 summarises the unadjusted rate ratios and 95% confidence intervals for each exposure category and the unadjusted hazard ratios calculated using first injuries only through the Cox proportional method. The ratios and confidence intervals calculated by each method were generally quite similar. The final adjusted hazard ratios calculated by the Cox proportional methods, after adjusting for age, gender, occupation, industry, and region, are presented in table 5. The results of the adjusted analysis indicates that the association between exposure and the risk of injury was only slightly affected by the influence of those covariates. This analysis found that, after adjusting for those factors, jobs with extended hours per day have a 37% higher injury hazard rate compared to jobs without that exposure. Similarly, working in a job with extended hours per week was associated with a 23% higher injury hazard rate, working in a job with overtime was associated with a 61% higher injury hazard rate, and working in a job with any overtime or extended hours schedule was associated with a 38% higher injury hazard rate. No association was detected between working in a job with extended commute time and the injury hazard rate.

DISCUSSION

This study of nationally representative data from the United States adds to the growing body of evidence indicating that work schedules involving long hours or overtime substantially increases the risk for occupational injuries and injuries. Unlike previous studies, our investigation had the advantage of covering a large variety of jobs, and controlling for the potential confounding affect of age, gender, occupation, industry, and region. We analysed nearly 100 000 job records extending over a 13 year period, and employed several statistical techniques for quantifying the extent of risk. The results of this study suggest that jobs with long working hours are not more risky merely because they are concentrated in inherently hazardous industries or occupations, or because of the demographic characteristics of employees working those schedules. Our findings are consistent with the hypothesis that long working hours indirectly precipitate workplace accidents through a causal process, for instance, by inducing fatigue or stress in affected workers. However, our findings are also consistent with other hypotheses and thus we cannot be certain of a causal connection based on this study alone.

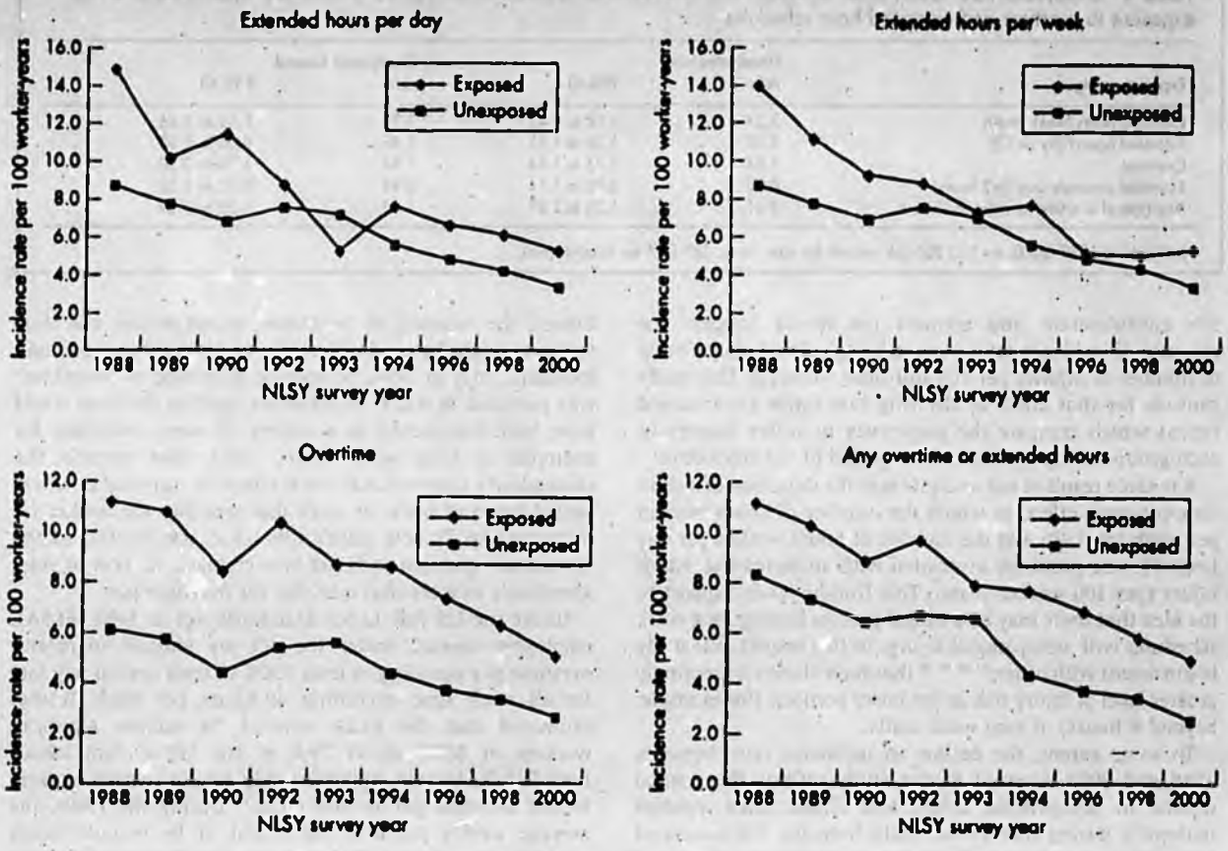

Figure 2 Trends in incidence rates of reported work related injuries and illnesses in jobs with and without exposure, by exposure category. NLSY survey periods 1988, 1989, 1990, 1992, 1993, 1994, 1996, 1998, and 2000. Note: NLSY changed the wording for the question regarding overtime in 1994, thereby potentially affecting the trend lines for "overtime" and "any overtime or extended hours".

Our comparison of injury incidence rates for workers in jobs with and without exposure was normalised by using a common denominator of 100 worker-years, thus avoiding a common methodological flaw that has afflicted some previous studies in this field. For example, workers who, on average, work longer hours (for example, 2500 hours per year) can be expected to experience more injuries than those who work shorter hours (for example, 2000 hours per year), even if the underlying risks to both groups are actually the same, because the former group spends more time "at risk" for injury. Many studies that have observed more injuries among persons who work longer hours have failed to take

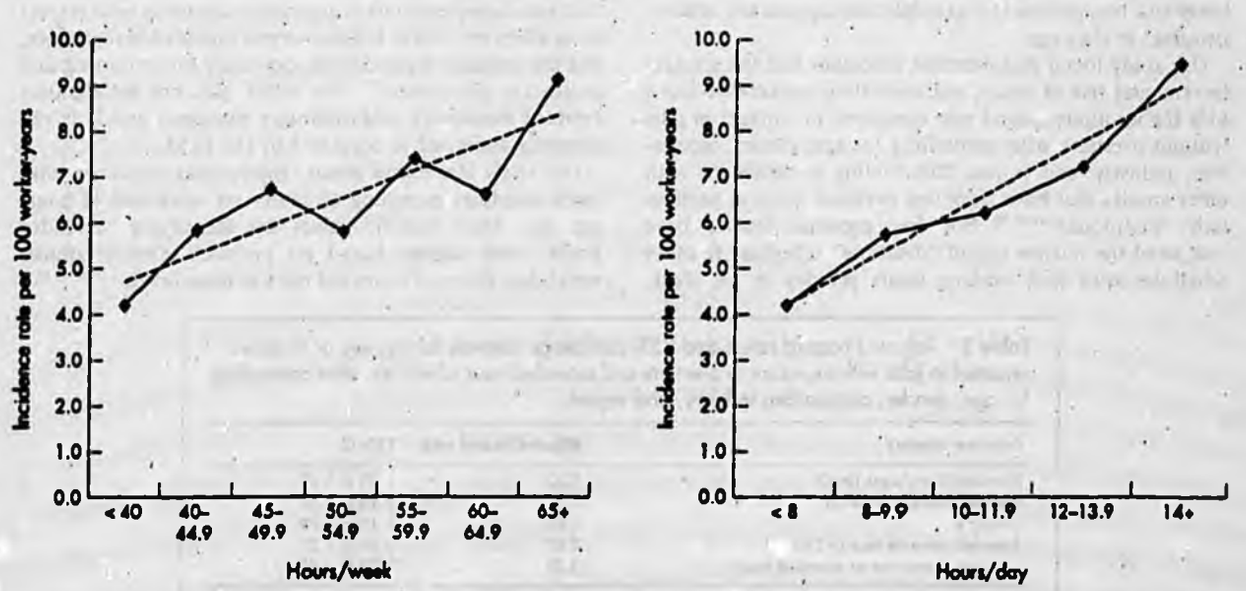

Figure 3 Trends in incidence rates of reported work related injuries and illnesses in jobs with and without exposure, for two exposure categories (hours/week and hours per day), by amount of exposure. NLSY aggregated data covering 1987–2000.

Table 4 Unadjusted rate ratios, hazard ratios, and 95% confidence intervals for injuries or illnesses reported in jobs with exposure to overtime and extended hour schedules

Exposure category	Unadjusted rate ratio	95% CI	Unadjusted hazard ratio	95% CI
Extended hours/week (≥60)	1.29	1.18 to 1.42	1.29	1.15 to 1.46
Extended hours/day (≥12)	1.38	1.26 to 1.51	1.46	1.30 to 1.63
Overtime	1.84	1.75 to 1.94	1.84	1.70 to 2.00
Extended commute time (≥2 hours)	0.93	0.75 to 1.14	0.94	0.72 to 1.22
Any type of overtime or extended hours	1.41	1.35 to 1.48	1.48	1.38 to 1.59

NLSY data, 1987–2000. n=110 236 job records for rate ratios, 109 087 for hazard ratios.

this consideration into account (as would happen, for instance, if incidence rates were to be calculated on the basis of number of injuries per 100 full-time workers). This study controls for that effect by deriving rate ratios (and hazard ratios) which compare the propensity to suffer injuries in each group during a standardised period of "at risk" time.

A notable result of our analysis was the detection of a clear dose-response effect, in which the number of hours worked per week (over 40) and the number of hours worked per day (over 8) were positively associated with an increasing risk of injury (per 100 worker-years). This finding lends support to the idea that there may be a causal process linking long work schedules with occupational injury. In this respect, our study is consistent with others[21–23 34 70] that have shown increasingly greater level of injury risk in the latter portions (for example, beyond 9 hours) of long work shifts.

To some extent, the decline in incidence rates between 1988 and 2000 observed in our study reflects the general decline in occupational injury and illness rates reported nationally during that period. Data from the US Bureau of Labor Statistics (BLS) indicate that occupational injury and illness rates (all case, private industry) decreased by 29% during that period, from an average of 8.6 to 6.1 reportable cases per 100 workers.[72] That decline has been attributed to various possible causes, including safer workplaces and a shift from manufacturing to service oriented jobs, which typically have lower average incidence rates.[73] Another factor that may help to explain the relatively larger (54–69%) rate decreases observed in our study is the aging of our cohort, who were 23–31 years old in 1988 and 35–43 years old as of 2000. Younger workers generally have higher incidence rates than older ones, in part because workers tend to move into lower risk occupations (for example, managerial and administrative) as they age.

Our study found that overtime schedules had the greatest incremental risk of injury, with overtime workers having a 61% higher injury hazard rate compared to workers in jobs without overtime, after controlling for age, gender, occupation, industry, and region. This finding is consistent with other studies that have identified overtime work as particularly hazardous.[22 29 30 74] But few previous studies have compared the relative risk of "overtime" schedules to other schedules with long working hours per day or per week. Indeed, the meaning of "overtime" is not precise, and thus the term might be used differently in different contexts and locations. Prior to 1994, no specific definition of "overtime" was provided to NLSY respondents, and so the term could have been interpreted in a variety of ways: referring, for example, to long work hours, work that exceeds the respondent's conventional work schedule, unusual or unexpected hours of work, or work that qualifies the worker for overtime pay. To help clarify this issue, the wording of the "overtime" question in NLSY was changed in 1994 to refer specifically to work that qualifies for overtime pay.

Under the US Fair Labor Standards Act of 1938 (FLSA), employees covered under the act are entitled to receive overtime pay equalling at least 150% of their regular pay rate for all work time exceeding 40 hours per week. It was estimated that the FLSA covered 74 million American workers in 2000, about 79% of the US civilian labour force.[75 76] On average, approximately 20% of covered workers receive overtime pay in any week.[77] During the 1990s, the average weekly overtime hours put in by manufacturing workers covered by FLSA grew by 25%.[78] Workers exempt from FLSA coverage include most administrative, professional, executive, supervisory, and outside sales personnel who are paid on a salaried basis. New regulations recently promulgated by the US Department of Labor have extended the FLSA exemptions to an additional 8 million white-collar workers.[79]

In the USA, approximately 19–33% of overtime work is mandatory (also called "compulsory", "forced", or "involuntary").[78 80] Mandatory overtime is overtime work required by employers, often under the threat of job loss or other penalty if the worker fails to comply. Several studies have suggested that mandatory overtime is especially hazardous with respect to its affect on worker fatigue, stress, impaired performance, and the potential for accidents, especially in the nursing and healthcare professions.[78] The NLSY did not differentiate between mandatory and voluntary overtime, and it is not currently addressed or regulated by the FLSA.

Our study also found greater injury risks associated with work schedules exceeding 60 hours per week and 12 hours per day. These specific values for identifying "extended hours" were chosen based on previous research studies which had detected increased risks at those levels.[6 11 23 30 61 62]

Table 5 Adjusted hazard ratios and 95% confidence intervals for injuries or illnesses reported in jobs with exposure to overtime and extended hour schedules, after controlling for age, gender, occupation, industry, and region

Exposure category	Adjusted hazard ratio	95% CI
Extended hours/week (≥60)	1.23	1.05 to 1.45
Extended hours/day (≥12)	1.37	1.16 to 1.59
Overtime	1.61	1.43 to 1.79
Extended commute time (≥2 hours)	0.87	0.59 to 1.23
Any type of overtime or extended hours	1.38	1.25 to 1.51

NLSY data, 1987–2000, n=109 087 job records.

Main messages

- Working in jobs with schedules that routinely involve overtime work or extended hours increases the risk of suffering an occupational injury or illness.
- Overtime schedules had the greatest relative risk of occupational injury or illness, followed by schedules with extended (≥12) hours per day and extended (≥60) hours per week.
- The risk of injury was found to increase with the increasing length of the work schedule, even after controlling for the entire amount of working time spent "at risk" for injury.
- Multivariate analyses indicated that the increased injury risks are not merely the result of the demanding work schedules being concentrated in riskier occupations or industries.
- These results are consistent with the hypothesis that long working hours indirectly precipitate workplace accidents by inducing fatigue or stress in affected workers.

Policy implications

- This study supports initiatives of the European Union and other governments to regulate the length of working schedules.
- Proposals in the United States to modify the Fair Labor Standards Act should examine the impact of those proposed changes on the injury risks associated with overtime work.
- Strategies for preventing workplace injuries and illnesses should consider changes in work organisation and job design addressing the length of work schedules and the performance of overtime work.

However, increased risks also have been detected at other work-hour levels by a variety of researchers and there is as yet no consensus criterion for the precise amount of work that is considered to be hazardous. In an attempt to create uniform labour standards, the European Union issued a Working Time Directive in 1993 that limited normal working hours to no more than 48 per week (averaged over a four month period) and specified other requirements related to rest breaks, shift work, and overtime. Some European nations (for example, the UK) have introduced provisions for workers to voluntarily opt out of these requirements or to otherwise provide flexibility in their implementation.

Study limitations

This study was based on self-reported information from NLSY cohort members regarding their employment and injury/illnesses experiences. Respondents were asked to recall information from the time of the previous interview, which in most cases was one year (for the 1988–1994 surveys) or two years (for the 1996–2000 surveys). There were no means to externally validate their responses. Our results, therefore, may be subject to potential inaccuracies related to the inability of respondents to recall information correctly. At the same time, the NLSY has advantages in this regard compared to other self-reported surveys in that the cohort had been surveyed regularly since 1979 and thus was quite familiar with the questionnaire, the response process, and the information required. Also, the NLSY was not designed to be a survey about work related injuries and illnesses or demanding work schedules—its primary objective was to evaluate participants' long term labour market transitions and wage history. The survey thus avoids problems of information bias that typically plague attempts to ask injured workers about their working conditions and job exposures. Unlike data sources related specifically to the field of occupational safety and health, it is unlikely that respondents to the NLSY will intentionally or unintentionally be attempting to justify the legitimacy of a work related disorder, establish its compensability under workers' compensation laws, or establish the employer's culpability for the injury. All of those issues are unrelated to the main concerns of NLSY and thus the data obtained presumably will be less susceptible to contamination by such considerations.

A strength of the study is its ability to control for the potential confounding affects of age, gender, occupation, industry, and region. However, many other potential covariates—such as workers' education and income levels, family composition, and health status—were not considered in the analysis, and thus their influence was not assessed. Our methods for considering the risks imposed by workers' occupation and the employer's industry classification may have masked more subtle differences related to particular job assignments within a broader occupational classification or specific industry group.

Because the study was based on secondary analysis of existing national data, we were also limited in our ability to evaluate other potentially important aspects of the dynamics underlying the risks of long working hours. For example, we did not have information available on the time of day the injury occurred, the kinds of job activities being performed, or the specific cause of the injury. However, information was available about the type of shift generally worked on each job (day, night, evening, split, or rotating shift) and thus we were able to consider the influence of shift work on injury risk and the combination affect of working both an unconventional shift schedule and long working hours. Those results will be reported in a separate publication.

Policy implications

The ultimate reason for conducting this research is to prevent occupational injuries and illnesses, promote overall worker health, and minimise the adverse consequences to affected workers. Most authorities believe that effective prevention of workplace injuries and illnesses requires a multifaceted approach that combines comprehensive hazard identification and control, ergonomic job design, worker training, medical surveillance, competent supervision, and a workplace culture and organisation that promotes optimal safety and health.

The results of this study suggest that special attention needs to be paid to establishing protective measures for people working overtime. For example, intensive accident hazard identification and control procedures (for example, periodic safety inspections) could be focused towards jobs in which employees work overtime schedules. Other protective approaches might include changes in work organisation (for example, periodic rest brakes, redesigning processes to avoid the need for overtime assignments, and employing more people to work fewer hours each), employer sponsored health promotion programmes (for example, counselling and education about the risks of long work schedules, periodic medical surveillance examinations for "at risk" workers, and ergonomic redesign to decrease job demands), and individual coping and behavioural practices (for example, maintaining good sleep and nutrition, getting daily physical exercise and regular medical care, avoiding drugs and alcohol, and seeking

supportive services when needed). Our study was not aimed at assessing the effectiveness of these interventions in decreasing the risk of injury, and additional research is needed in this regard.

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Answers to questions on *Genetic screening and occupational and environmental exposures* by P Vineis *et al*, on pages 657–662

(1) c; (2) a and b; (3) b and d; (4) c and d; (5) d

Long work hours and occupational injuries: new evidence on upstream causes

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Occupational injuries

Long work hours and occupational injuries: new evidence on upstream causes

D Loomis

Commentary on the paper by Dembe *et al* (see page 588)

Epidemiological research on the causes of occupational traumatic injuries presents interesting practical and conceptual challenges. On a superficial level, the causation of injuries seems deceptively simple, because the agent of injury—energy—is already known. One of the problems researchers face, however, is that the transfer of potentially harmful energy to a human host is difficult to observe because it takes place very quickly and is rarely recorded or documented in databases. New studies are beginning to take up these challenges with innovative approaches like the case-crossover design.[1] Another challenge, perhaps conceptually more difficult, is that because the agent of injury is known, its discovery is not an important research problem. Instead, it is the "upstream" causes[2] of injury—the events and circumstances that bring people into contact with the agent—that are of interest. Some studies published recently in this journal have investigated potential causes upstream of the injured worker, ranging in proximity from the organisation of workplaces[3] to the structure of the national economies.[4]

In this issue, Dembe and colleagues[5] use individual-level data from a national longitudinal survey in the United States to investigate another upstream risk factor for occupational injury: extended work time. The authors' analyses of this large database show the rate of injury increasing quantitatively with the number of hours worked on a daily or weekly basis. Among people who worked more than 12 hours per day or more than 60 hours per week, the rate of injury and illness was roughly 30–40% higher than among those working fewer hours. Working overtime was associated with a still higher rate of injury, about 60–80% greater than among people who did not work overtime. These associations were statistically significant and remained after adjustment for age, gender, occupation, industry, and region.

These findings draw attention to the potential importance of a pervasive trend in the current labour market. In the United States, the average number of hours worked by all employed people and the average number of overtime hours for manufacturing workers have been on the increase since the 1970s.[6] American workers—and many others around the world—have been working longer as global competition has intensified. If the findings of this new study represent the US experience, the implications would be alarming: the combination of lengthening work weeks and injury rates that increase with extended time on the job could result in an increase in the rate of injury for the entire workforce. Such an increase has not been observed, however. Instead, as Dembe *et al* show in fig 2, the overall rates of occupational injury and illness have been declining with time.[6]

Ecological trends in working hours and injury rates make a good starting point for looking upstream, but they clearly do not tell the whole story and the potential adverse effects of longer work schedules are far-reaching enough to motivate more research. One possible explanation for the apparent conflict between national trends and the findings Dembe *et al* report is that longer hours may only result in greater risk for a subset of workers—perhaps those with greater potential exposure to the agent of injury. Studies investigating the effects of extended work hours by occupation and industry might lead to insights about who is at risk when working hours increase. It is also possible that the reported results do not generalise to the entire labour force. The survey on which the study is based was designed to be statistically representative of people living in the United States in 1979 who were born between 1957 and 1964—a large group in absolute numbers, but a small proportion of the workforce at the time of the study, whose jobs and health experience may not be typical. It would be useful to learn whether similar relationships are seen in other cohorts, for US workers generally, and in other countries. The current paper also leaves unanswered questions about time related aspects of the relationship between injury risk and work schedules. The data shown in fig 2 of the paper suggest that the greatest differences in risk between workers exposed and not exposed to extended hours occurred in the 1980s, but in later years injury rates for exposed workers declined more rapidly, erasing much of the difference by 2000. However, the analysis simply compares average rates during the entire study period and does not account for this potential interaction between calendar time and exposure. Future studies might analyse temporal trends in both injury rates and working hours in the hope of learning whether the effect of longer work hours still exists and whether it is likely to persist in the future.

Good research tends to raise questions as well as answer them, and in this respect Dembe and his colleagues have succeeded admirably. Their paper on the impact of overtime and long work hours presents provocative findings and should stimulate further investigation of this important issue, looking both upstream at the factors that drive the trends towards longer work schedules and downstream toward possible mechanisms of injury.

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Opposition to Mandatory Overtime

Summary: Shortages of available or experienced nurses have added another dimension to inadequate staffing brought about through purposeful restructuring, downsizing and substitution of unlicensed assistive personnel (UAP) for registered nurse staff in hospitals. The use of mandatory overtime as a solution to nurse staffing shortages is rampant today, and is pushing nurses beyond their capacity to work safely and to provide appropriate, quality care to patients. Nearly half of the respondents to a recent ANA staffing survey reported mandatory overtime being used to cover staffing shortages (ANA Staffing Survey, 2001). In addition, inadequate staffing is a source of nurses' job dissatisfaction, further contributing to the problem of recruitment and retention of nurses, and with the attraction of new talent to the profession. The absence of prohibitions or limitations on overtime work may contribute to health care errors, as well as work-related illnesses and injuries among nursing staff. ***ANA opposes the use of mandatory overtime as a staffing tool.*** Only individuals are capable of determining their capacity to work beyond their predetermined, regular work schedules. No employee of a health care facility should be required or forced to work overtime. Individual nurses are expected to exercise their critical judgment in determining their ability to provide safe patient care.

Background

Nurses report a dramatic increase in the use of mandatory overtime to solve staffing problems and fear potential consequences for safety and quality of care for their patients. Nurses are fully cognizant and concerned about inadequate staffing. In addition, they are also resentful that they bear the personal, professional and legal burden for this problem that is perceived by nurses as a violation of their human rights. This practice causes the nurse to assume accountability and liability for potentially unsafe situations and/or loss of their employment.

Little research has been done to comprehensively evaluate overtime and its relationship to productivity, quality and safety provided in hospitals or the incidence of work place accidents, injuries and stress-related illnesses among nurses. There is limited research evaluating implications of extended/overtime work on health status health care workers (Samkoff and Jacques, 1991). The available research has, however, indicated a relationship between extended shifts and fatigue and generalized performance (Galinsky, et. al., 1993; Sawin and Scerbo, 1995; Pilcher and Huffcutt, 1996; Spurgeon, Harrington and Cooper, 1997). The absence of a solid research foundation on extended hours of work on nurses makes it easier to abuse the hours of work -- especially when work revolves around the care of vulnerable human beings with needs that span the full 24 hours in a day.

Nurses believe employer dependence on the use of mandating last-minute overtime, or of using peer pressure as a negative motivator, alleviates a sense of urgency or necessity to proactively find safer and more appropriate staffing. In fact, in some areas, (mandatory) overtime is used as a component of staffing models and the phrase "mandation" has been coined to define the methodology. Many nurses contend employers insist they stay for an extra shift (or more) or face dismissal for insubordination, as well as being reported to the state board of nursing (BON) for patient abandonment.

Provision 5 of the ANA *Code of Ethics for Nurses with Interpretive Statements* (2001), notes that "The nurse owes the same duties to self as to others, including the responsibility to preserve integrity and safety, to maintain competence, and to continue personal and professional growth." Interpretative Statement 5.4 continues and further states that "Where patterns of institutional behavior or professional practice compromise the integrity of all its nurses, nurses should express their concern or conscientious objection collectively to the appropriate body or committee. In addition, they should express their concern, resist, and seek to bring about a change in those persistent activities or expectations in the practice setting that are morally objectionable to nurses and jeopardize either patient or nurse well-being."

Definitions:

Overtime is . . .
the hours worked in excess of an agreed upon, predetermined, regularly scheduled full-time or part-time work schedule, as determined by contract, established work scheduling practices, policies or procedures.

Patient abandonment is . . .

a unilateral severance of the established nurse-patient relationship without giving reasonable notice to the appropriate person so that arrangements can be made for continuation of nursing care by others. Refusal to accept an assignment (or a nurse-patient relationship) does not constitute patient abandonment.

A number of state boards of nursing have issued advisory opinions or positions on what does, and does not, constitute abandonment. Included among them are: Alabama, California, Michigan, Ohio and Oregon. In each state's comments, abandonment is defined, and matters that are subject to discipline by the state board are differentiated from those that should be handled by the employer. In a unique approach, the South Carolina BON has issued an advisory opinion stating that 12 hours of work should be a maximum expectation when considering the nurse's ability to ensure safe patient care delivery. The Michigan BON noted that nurses who exercise critical judgement in rejecting a request to work overtime because they believe they cannot safely provide care are not abandoning their patients (*The Michigan Nurse*, April 2001). In addition to action taken by individual BONs, the Delegate Assembly of the National Council of State Boards of Nursing, Inc. (NCSBN) passed a resolution which "recognizes the professional responsibility of nurses to accept or decline overtime assignments based on their self assessment of ability to provide safe care."

The American Nurses Association remains very concerned about the impact of mandatory overtime on the ability of the nation's nurses to provide high quality health care services. ANA believes that the elimination of mandatory overtime for the nation's nurses is a critical success factor in efforts to improve the quality of health care and improved working conditions for nurses.

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