ia BPG

Healthy Work Environments
Best Practice Guidelines

AUGUST 2011

Preventing and Mitigating
Nurse Fatigue in Health Care

ia RNAO

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Greetings from Doris Grinspun,

Executive Director Registered Nurses' Association of Ontario

It is with great pleasure that the Registered Nurses' Association of Ontario (RNAO) releases the *Preventing and Mitigating Nurse Fatigue in Health Care Healthy Work Environments Best Practice Guideline*. This is one of a series of Best Practice Guidelines (BPG) on Healthy Work Environments (HWE) developed by the nursing community to date. The aim of these guidelines is to provide the best available evidence to support the creation of healthy and thriving work environments. These guidelines, when applied, will serve to support the excellence in service that nurses are committed to delivering in their day-to-day practice. The RNAO is delighted to be able to provide this key resource to you.

We offer our endless gratitude to the many individuals and institutions who make our vision for HWE BPGs a reality: the Government of Ontario for recognizing the RNAO's ability to lead the program and for providing generous funding; Irmajean Bajnok, Director, RNAO International Affairs and Best Practice Guidelines (IABPG) Programs, for her expertise and leadership in advancing the production of HWE BPGs; all HWE BPG Panel Team Leaders, and for this BPG in particular, Ann E. Rogers and Milijana Buzanin for their superb stewardship, commitment and, above all, exquisite expertise. We also thank Althea Stewart-Pyne, Program Manager, RNAO, IABPG, who provided the coordination and worked intensely to see that this BPG moved from concept to reality. A special thanks to the BPG panel -- we respect and value your expertise and volunteer work. To all, we could not have done this without you!

The nursing community, with its commitment to and passion about, excellence in nursing care and healthy work environments, has provided the knowledge and countless hours essential to the creation, evaluation and revision of each guideline. Employers have responded enthusiastically by nominating best practice champions, implementing and evaluating the guidelines, and working toward a culture of evidence-based practice and management decision-making.

Creating healthy work environments is both an individual and collective responsibility. Successful uptake of these guidelines requires a concerted effort by governments, administrators, clinical staff and others, partnering together to create evidence-based practice cultures. We ask that you share this guideline with members of your team. There is much we can learn from one another.

Together, we can ensure that nurses and other health-care workers contribute to building healthy work environments. This is central to ensuring quality patient care. Let's make health-care providers and the people they serve the real winners of this important effort!

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APPENDICES

Throughout this document, words marked with the letter "G" can be found in the Appendix A: Glossary of Terms.

How To Use this Document

The *Preventing and Mitigating Nurse Fatigue in Health Care Healthy Work Environments Best Practice Guideline* is an evidence-based document that focuses on preventing and addressing nurse fatigue in the workplace.

The 2010 Registered Nurses' Association of Ontario (RNAO)/Canadian Nurses Association (CNA) research paper on nurse fatigue and patient safety[1] defines nurse fatigue as:

"A subjective feeling of tiredness (experienced by nurses) that is physically and mentally penetrative. It ranges from tiredness to exhaustion, creating an unrelenting overall condition that interferes with individuals' physical and cognitive ability to function to their normal capacity. It is multidimensional in both its causes and manifestations; it is influenced by many factors: physiological (e.g. circadian rhythm), psychological (e.g. stress, alertness, sleepiness), behavioural (e.g. pattern of work, sleep habits) and environmental (e.g. work demand). Its experience involves some combination of features: physical (e.g. sleepiness) and psychological (e.g. compassion fatigue, emotional exhaustion). It may significantly interfere with functioning and may persist despite periods of rest."

The guideline contains much valuable information. We recommend that you review and reflect on the document over time and implement the recommendations as appropriate for your organization. The following approach may be helpful to individuals and teams embarking on implementing this guideline.

1. **Study the Healthy Work Environments Organizing Framework:** The *Preventing Nurse Fatigue in Health Care Best Practice Guideline* is built upon the Healthy Work Environments Organizing Framework that was developed by the RNAO to enable users to understand the relationships between and among the key factors that influence the work environment. Understanding the framework is critical to using the guideline effectively. We suggest that you spend time reading and reflecting upon the framework as a first step.

2. **Identify an area of focus:** Once you have studied the framework, we suggest that you identify an area of focus for yourself, your situation, or your organization. Select an area that you believe needs attention to provide a supportive environment that prevents nurse fatigue and enables safe, quality care.

3. **Read the recommendations and the summary of research for your area of focus:** A number of evidence-based recommendations are offered for each major element of the Healthy Work Environment Framework. The recommendations are statements regarding what nurses, organizations, and systems do, or how they behave, in order to provide a work environment that prevents nurse fatigue. The literature supporting these recommendations is briefly summarized, and provides the evidence-based rationale for the recommendations.

4. **Focus on the recommendations or desired behaviours that are most appropriate for you and your current situation:** The recommendations contained in this document are not meant to be applied as rules; rather, they are tools to assist individuals and organizations to make decisions that provide a supportive work environment that prevents nurse fatigue, recognizing everyone's unique cultural, climate and situational challenges. In some cases, there is a substantial amount of information to consider. Readers may wish to further explore and identify those situations and practices that need to be examined and/or strengthened in their own situations.

5. **Make a tentative plan:** Having selected recommendations and behaviours for attention, consider strategies to successfully implement them. Make a tentative plan for what you might actually do to begin to address your area of focus. If you require more information, refer to the reference citations, or review the risk assessment tools identified in Appendix C.

6. **Discuss the plan with others and revise as necessary:** Take time to solicit input regarding your plan from people whom it might affect or whose engagement will be critical to success, and from trusted advisors, who will give you honest and helpful feedback on the appropriateness of your ideas.

7. **Get started and review your plan regularly:** It is important that you review your plan often and make adjustments as you proceed with implementation of this guideline.

The development of healthy work environments in health care is ongoing: **Enjoy the journey!**

Purpose and Scope

Purpose

This best practice guideline has been developed to identify and describe:

- practices that result in preventing and mitigating fatigue for nurses and other health-care professionals;
- system resources that support practices to prevent fatigue;
- organizational culture, values and resources that support effective practices to prevent fatigue;
- personal resources that can be used to prevent or mitigate fatigue; and
- anticipated outcomes when fatigue is effectively managed.

Scope

This best practice guideline addresses:

- knowledge, competencies and behaviours that recognize, prevent and mitigate fatigue;
- educational requirements and strategies;
- policy changes at organizational and system levels needed to support and sustain practices that prevent and mitigate fatigue;
- implementation strategies and tools;
- evaluation criteria and tools; and
- future research opportunities.

Target Audience

This best practice guideline is relevant to nurses in:

- all roles, including clinical nurses, administrators, educators, researchers and those engaged in policy work;
- all domains of nursing (clinical practice, administration, education, research and policy), as well as nursing students; and
- all practice settings.

This best practice guideline will also be helpful for:

- interprofessional team members;
- non-nursing administrators at the unit, organizational and system levels;
- policymakers and governments;
- professional organizations, employers and labour groups; and
- federal, provincial and territorial standard-setting bodies.

Summary of Recommendations for Preventing Nurse Fatigue in Health Care

The following recommendations were organized using the key concepts of the Healthy Work Environments Framework and therefore identify:

- External/System recommendations
- Organizational recommendations, and
- Team/Individual recommendations

External/System Recommendations

1.0 Government Recommendations

1.1 Governments at both national and provincial levels promote the management of fatigue in health-care work environments by:

a) Providing sufficient economic and human resources within the work environment to prevent and mitigate fatigue.

b) Providing funding to support mandatory education for practicing nurses, nurse managers, nursing students and nurse educators about the causes of fatigue and its negative impacts on patients and nurses.

c) Providing funding to ensure that adequate physical infrastructure is available to support areas for nurses to rest during scheduled breaks. This means including designated space for rest in all new building designs and providing funding to renovate existing facilities.

d) Increasing nursing school enrolment and funding to so that there will be sufficient numbers of graduates in the future to ensure appropriate nurse to patient ratios in health-care settings.

e) Providing financial support to nursing faculties to manage increased enrolment in graduate nursing programs.

2.0 Research Recommendations

2.1 Researchers partner with governments, professional associations, regulatory bodies, unions, health-service organizations and educational institutions to conduct research regarding the relationship between fatigue, workload, work hours and the amount of sleep needed to provide safe patient care.

The goals are to: (a) increase understanding of the relationship between nurse fatigue and patient safety; (b) identify measures to decrease fatigue; and (c) reduce the impact of fatigue on patient and nurse safety.

Researchers work together across professions to achieve the above goals through studying:

a) Hours worked, 12-hours shifts, on-call patterns and intervals between shifts worked by nurses at all levels (e.g. staff nurses, managers, nurse practitioners, nurse midwives, etc., in a variety of health-care settings).

b) The gap in provincial infrastructure, to accurately monitor nurses' working hours, as many nurses hold positions in multiple organizations across health-care sectors.

c) The prevalence and incidence of fatigue based on gender, marital status, lifestyle and age.

d) The efficacy of programs to determine, assess and mitigate fatigue in health-care settings.

e) The nature of mitigating factors influencing fatigue in the workplace, including part-time employment and nurses working multiple jobs.

3.0 Accreditation Recommendations

3.1 Accreditation bodies develop and implement standards in the accreditation process that address a culture of safety, including the prevention and mitigation of nurse fatigue, and incorporate the recommendations contained in this guideline.

4.0 Education Recommendations

4.1 Occupational health and safety educational programs include formal and informal education sessions that address:

a) recognizing and preventing fatigue;

b) the factors that contribute to fatigue;

c) the implications of nurse fatigue on patient safety, nurse well-being and organizational well-being;

d) sleep hygiene; and

e) utilizing self-assessment practices for fatigue.

4.2 Academic Settings address the issue of nursing fatigue in the curriculum by:

a) incorporating content related to nurse fatigue in the curriculum for nursing students, preceptors, professors and other educators; and

b) establishing a method of evaluation that feeds back into the process to determine if student nurse fatigue and nursing faculty fatigue in the academic setting and workplace have been reduced.

4.3 Organizations and academic settings:

a) incorporate information regarding fatigue prevention and recognition strategies into orientation programs for staff, nursing students and preceptors;

b) enhance leadership courses to address issues related to fatigue; and

c) promote research to assist health-care organizations in implementing and evaluating strategies to address nurse fatigue.

5.0 Nursing Professional/Regulatory Recommendations

5.1 Professional associations, regulatory bodies and unions promote practices that result in preventing and mitigating fatigue for nurses and other health-care professionals that contribute to healthy work environments.

5.2 Professional associations and unions collaborate, advocate for and promote a workplace culture that recognizes the impact of fatigue on both patient safety and nurses' overall health and well-being.

5.3 Nursing regulatory bodies develop standards of practice that recognize the impact of fatigue on patient safety and nurses' overall health and well-being.

5.4 Professional associations, regulatory bodies and unions promote the education of nurses regarding their professional responsibility related to managing personal fatigue and mitigating the impact of fatigue on safe, quality patient care.

5.5 Professional associations, regulatory bodies and unions advocate for safe work environments with appropriate staffing models that include adequate registered nursing staffing to address workload, overtime issues and scheduling practices that minimize fatigue.

5.6 Professional associations, regulatory bodies and unions support and encourage a healthy work environment for all health-care professionals.

5.7 Regulatory bodies set practice standards and guidelines applicable to nurses and employers to ensure quality practice environments.

5.8 Unions, professional associations and nursing regulatory bodies encourage nurses and organizations to identify, document and collaboratively address unsafe staffing conditions.

6.0 Organizational Recommendations

6.1 Organizations and academic centres promote a culture that recognizes nurse fatigue as a risk to patient and nurse safety that must be addressed by comprehensive fatigue prevention and management programs that include:

a) educating staff and leadership on fatigue management;

b) developing mechanisms to document fatigue and analyze its relationship to overtime hours worked, medication errors, and patient and staff outcomes;

c) providing fatigue assessment strategies through orientation and other professional development opportunities; and

d) support services, such as wellness initiatives and Employee Assistance Programs, to assist with contributors to fatigue.

6.2 Organizations plan, implement and evaluate staffing and workload practices that create adequate staffing to reduce workload, in order to mitigate nurse fatigue and ensure nurse and patient safety.

6.3 Organizations implement a safe scheduling policy that includes no more than 12 hours scheduled within a 24-hour period, and no more than 50 hours scheduled per seven-day work week.

a) Scheduling for nights should not involve more than three consecutive 12-hour night shifts and should include a longer interval of "off duty" time between blocks of shifts to recover

6.4 Organizations develop and implement a policy – in consultation with nursing unit councils, the occupational health/wellness department, scheduling committees, unions and regulatory bodies – that sets limits regarding the amount of overtime worked by nurses.

6.5 Organizations develop a policy that supports rest and sleep periods during scheduled breaks. Organizations furthermore create a safe, secure area where nurses can have uninterrupted (excluding emergencies) rest and sleep periods. Individual nurse retain professional accountability and responsibility to respond to emergencies.

7.0 Team/Individual Recommendations

7.1 All employees, physicians, volunteers and students should:

- perform a self-assessment prior to starting and during a work shift to ensure their fitness to work and provide safe provision of care;
- ensure adequate recovery time prior to starting a shift;
- take entitled breaks and support colleagues to do the same; and
- limit overtime hours worked.

7.2 All employees, physicians, volunteers and students should take responsibility for identifying and reporting unsafe conditions (e.g. fatigue) in accordance with professional practice standards and hospital policy, without fear of reprisal.

7.3 All employees, physicians, volunteers and students should take responsibility for maintaining optimal personal health and well-being, including:

- participating in physical activity outside the work setting;
- ensuring adequate nutritional intake;
- ensuring adequate rest and sleep between shifts;
- communicating shift preference where there are known personal impacts related to specific shift patterns; and
- responsible self-scheduling in settings that participate in self-scheduling.

Sources and Types of the Evidence on Preventing Nurse Fatigue in the Workplace

Sources of Evidence

The search for evidence revealed experimental, quasi-experimental, descriptive and qualitative studies. Sources included:

- A systematic review of the literature on nurse fatigue (Appendix C).
- A supplemental literature search by panel members.

Types of Evidence

Current practice in creating best practice guidelines involves identifying the strength of the supporting evidence.[2] The prevailing systems of grading evidence rate systematic reviews of randomized controlled trials as the gold standard.[3] However, not all questions of interest are amenable to the methods of randomized controlled trials, particularly where the subjects cannot be randomized, or the variables of interest are pre-existing or difficult to isolate. This is particularly true of behavioural and organizational research, in which controlled studies are difficult to design due to continuously changing organizational structures and processes. Health-care professionals are concerned with more than cause-and-effect relationships and recognize a wide range of approaches to generate knowledge for practice. The evidence contained in this guideline has been rated using an adaptation of the "traditional levels" of evidence used by the Cochrane Collaboration[4] and the Scottish Intercollegiate Guidelines Network guideline.[5] Part of this adaptation includes use of the term "type of evidence" rather than "level of evidence," in keeping with the comprehensive nature of this guideline (Table 1).

Table 1. Types and description of evidence

Type of evidence	Description of evidence
A	Evidence obtained from randomized controlled trials and meta-analyses[G]
A1	Systematic review[G]
B	Evidence obtained from descriptive correlational studies[G]
C	Evidence obtained from qualitative research[G]
D	Evidence obtained from expert opinion[G]
D1	Integrative reviews[G]
D2	Critical reviews[G]

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BACKGROUND

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Background to the Healthy Work Environments Best Practice Guidelines Project

In July 2003, the RNAO, with funding from the Ontario Ministry of Health and Long-Term Care, commenced the development of evidence-based best practice guidelines in order to create healthy work environments[G] for nurses.[G] Just as in clinical decision-making, it is important that those focusing on creating healthy work environments make decisions based on the best available evidence.

The Healthy Work Environments Best Practice Guidelines[G] Project is a response to priority needs identified by the Joint Provincial Nursing Committee and the Canadian Nursing Advisory Committee.[6] The idea of developing and widely distributing a healthy work environment guide was first proposed in *Ensuring the care will be there: Report on nursing recruitment and retention in Ontario*[7] submitted to the Ministry of Health and Long-Term Care in 2000 and approved by the Joint Provincial Nursing Committee.

Health-care systems are under mounting pressure to control costs and increase productivity while responding to increasing demands from growing and aging populations, advancing technology and more sophisticated health-care consumers. In Canada, health-care reform is currently focused on the primary goals identified in the 2000 Federal/Provincial/Territorial First Ministers' Agreement,[8] and the 2003 and 2004 Health Accords, which are:[9,10]

- the provision of timely access to health services on the basis of need;
- high-quality, effective, patient/client-centred and safe health services; and
- a sustainable and affordable health-care system.

Nurses are a vital component in achieving these goals. A sufficient supply of nurses is central to sustain affordable access to safe, timely health care. Achievement of healthy work environments for nurses is critical to the safety, recruitment and retention of nurses.

Numerous reports and articles have documented the challenges in recruiting and retaining a healthy nursing workforce.[7,11-15] Indeed, some have suggested that the basis for the current nursing shortage is the result of unhealthy work environments.[16-19] Strategies that enhance the workplaces of nurses are required to repair the damage left from a decade of relentless restructuring and downsizing.

There is a growing understanding of the relationship between nurses' work environments, patient/client outcomes, and organizational and system performance.[20-22] A number of studies have shown strong links between nurse staffing and adverse patient/client outcomes.[23-33] Evidence shows that healthy work environments yield financial benefits to organizations with respect to reductions in absenteeism, lost productivity, organizational health-care costs,[34] and costs arising from adverse patient/client[G] outcomes.[35]

Achievement of healthy work environments for nurses requires transformational change, with "interventions that target underlying workplace and organizational factors."[36] It is with this intention that we have developed these guidelines. We believe that full implementation will make a difference for nurses, their patients/clients, and the organizations and communities in which they practice. It is anticipated that a focus on creating healthy work environments will benefit not only nurses but other members of the health-care team. We also believe that best practice guidelines can be successfully implemented only where there are adequate planning processes, resources, organizational and administrative supports, and appropriate facilitation.

Healthy work environment: Definition

A practice setting that maximizes the health and well-being of nurses, quality patient/client outcomes, organizational performance, and societal outcomes.

The six foundational *Healthy Work Environments Best Practice Guidelines*

1. Collaborative Practice Among Nursing Teams

2. Developing and Sustaining Effective Staffing and Workload Practices

3. Developing and Sustaining Nursing Leadership

4. Embracing Cultural Diversity in Health Care: Developing Cultural Competence

5. Professionalism in Nursing

6. Workplace Health, Safety and Well-being of the Nurse

Organizing Framework for the Healthy Work Environments Best Practice Guidelines Project

Physical/Structural Policy Components

External Policy Factors

Organizational Physical Factors

Physical Work Demand Factors

Cognitive/Psycho/Social Work Demand Factors

Organizational Social Factors

External Socio-Cultural Factors

Cognitive/Psycho/Socio/Cultural Components

Nurse/Patient/Client Organizational Societal Outcomes

Individual Nurse Factors

Organizational Professional/Occupational Factors

External Professional/Occupational Factors

Professional/Occupational Components

Individual Work Context Micro Level

Organizational Context Meso Level

External Context Macro Level

Figure 1. Conceptual model for healthy work environments for nurses: Components, factors and outcomes[13,37, 38]

A healthy work environment for nurses is complex and multidimensional, and has numerous components with relationships between the components. A comprehensive model is needed to guide the development, implementation and evaluation of a systematic approach to enhancing the work environment of nurses. Healthy 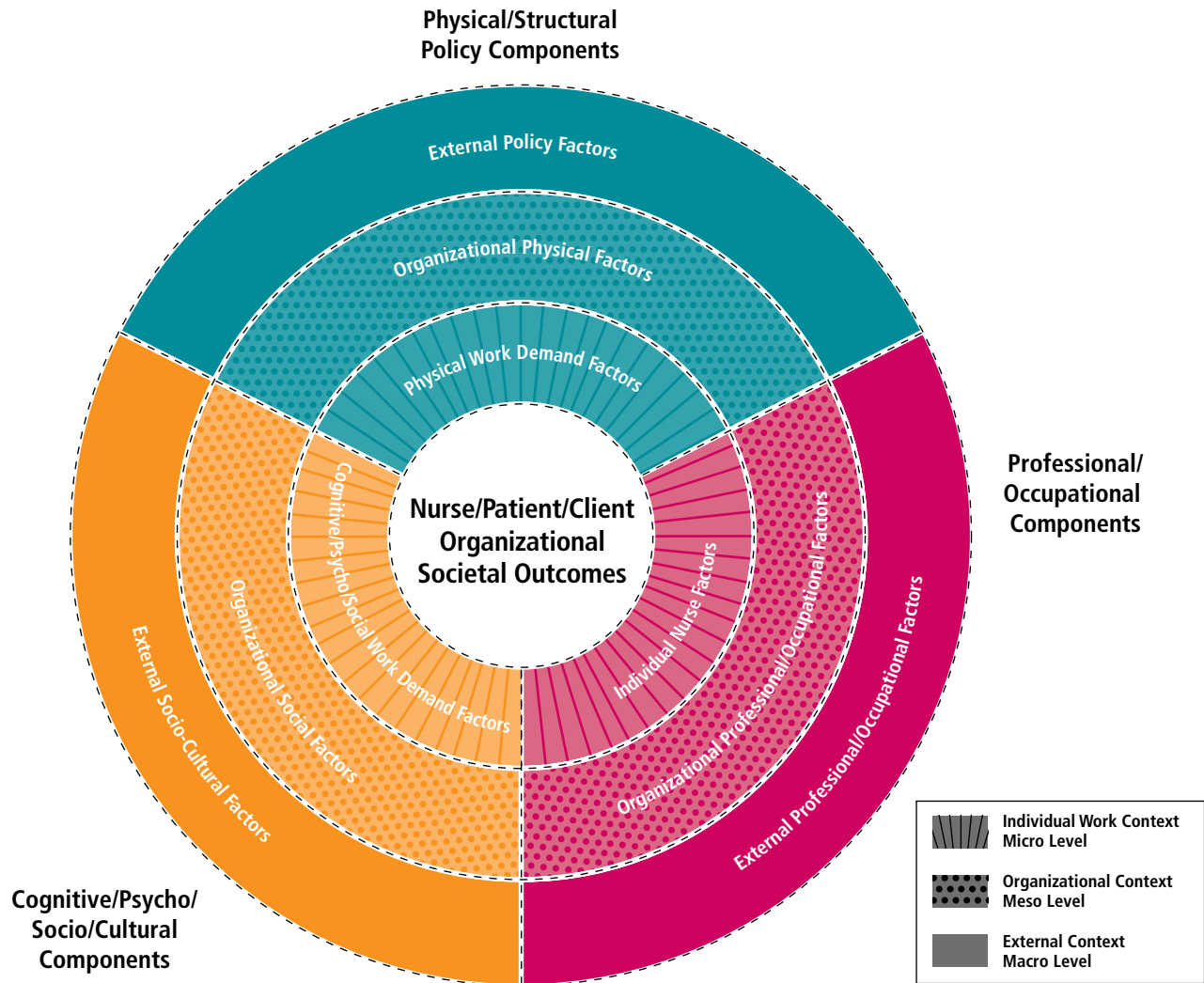work environments for nurses are defined as practice settings that maximize the health and well-being of the nurse, quality patient/client outcomes, organizational performance and societal outcomes.

The Comprehensive Conceptual Model for Healthy Work Environments for Nurses presents the healthy workplace as a product of the interdependence among individual (micro level), organizational (meso level) and external (macro level) system determinants as shown in the three outer circles in Figure 1. At the core of the circles are the expected beneficiaries of healthy work environments for nurses, i.e. nurses, patients, organizations, systems and society as a whole.[39] The lines within the model are dotted to indicate the synergistic interactions among all levels and components of the model.

The model suggests that the individual's functioning is mediated and influenced by interactions between the individual and her/his environment. Thus, interventions to promote healthy work environments must be aimed at multiple levels and components of the system. Similarly, interventions must influence not only the factors within the system and the interactions among these factors, but also influence the system itself.[17,40]

The assumptions underlying the model are as follows:

- healthy work environments are essential for quality, safe patient/client care;
- the model is applicable to all practice settings and all domains of nursing;
- individual, organizational and external system level factors are the determinants of healthy work environments for nurses;
- factors at all three levels affect the health and well-being of nurses, quality patient/client outcomes, organizational and system performance, and societal outcomes either individually or through synergistic interactions;
- at each level, there are physical/structural policy components, cognitive/psycho/social/cultural components and professional/occupational components; and
- the professional/occupational factors are unique to each profession, while the remaining factors are generic for all professions/occupations.

Physical/Structural Policy Components

- At the individual level, the Physical Work Demand Factors include the requirements of the work which necessitate physical capabilities and effort on the part of the individual.[18] Included among these factors are workload, changing schedules and shifts, heavy lifting, exposure to hazardous and infectious substances, and threats to personal safety.

- At the organizational level, the Organizational/Physical Factors include the physical characteristics and the physical environment of the organization, as well as the organizational structures and processes created to respond to the physical demands of the work. Included among these factors are staffing practices, flexible-scheduling and self-scheduling, access to functioning lifting equipment, occupational health and safety polices and security personnel.

- At the system or external level, the External Policy Factors include health-care delivery models, funding, and legislative, trade, economic and political frameworks (e.g. migration policies, health system reform) external to the organization.

Physical/Structural Policy Components

External Policy Factors

Organizational Physical Factors

Physical Work Demand Factors
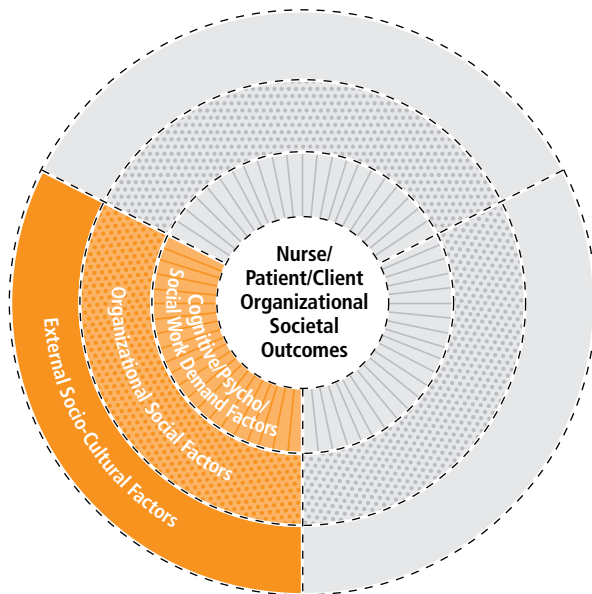
Nurse/
Patient/Client
Organizational
Societal
Outcomes
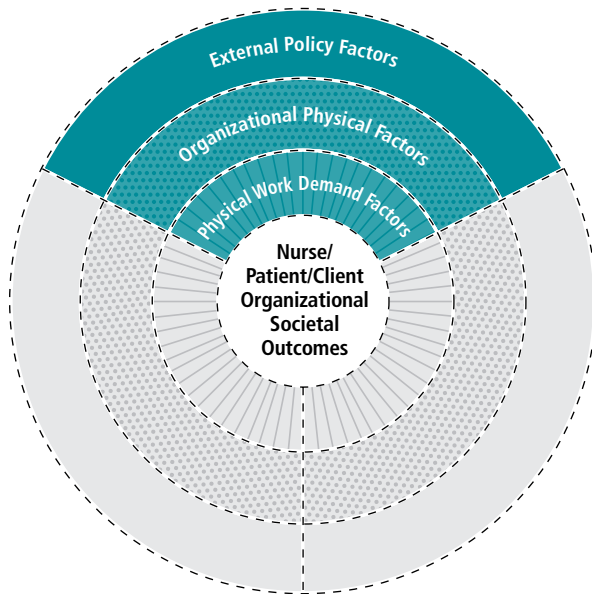
Cognitive/Psycho/Socio/Cultural Components

- At the individual level, the Cognitive and Psycho/Social Work Demand Factors include the requirements of the work which necessitate cognitive, psychological and social capabilities and effort (e.g. clinical knowledge, effective coping skills, communication skills) on the part of the individual.[18] Included among these factors are clinical complexity, job security, team relationships, emotional demands, role clarity, and role strain.

- At the organizational level, the Organizational Social Factors are related to organizational climate, culture, and values. Included among these factors are organizational stability, communication practices and structures, labour/management relations, and a culture of continuous learning and support.

- At the system level, the External Socio-cultural Factors include consumer trends, changing care preferences, changing roles of the family, diversity of the population and providers, and changing demographics - all of which influence how organizations and individuals operate.

Cognitive/Psycho/Socio/Cultural Components

Professional/Occupational Components

- At the individual level, the Individual Nurse Factors include the personal attributes and/or acquired skills and knowledge of the nurse which determine how she/he responds to the physical, cognitive and psycho-social demands of work.[18] Included among these factors are commitment to patient/client care, the organization and the profession; personal values and ethics; reflective practice; resilience, adaptability and self confidence; and family/life balance.

- At the organizational level, the Organizational Professional/Occupational Factors are characteristic of the nature and role of the profession/occupation. Included among these factors are the scope of practice, level of autonomy and control over practice, and intra-disciplinary relationships.

- At the system or external level, the External Professional/ Occupational Factors include policies and regulations at the provincial/territorial, national and international level which influence health and social policy and role socializations within and across disciplines and domains.

Professional/Occupational Components
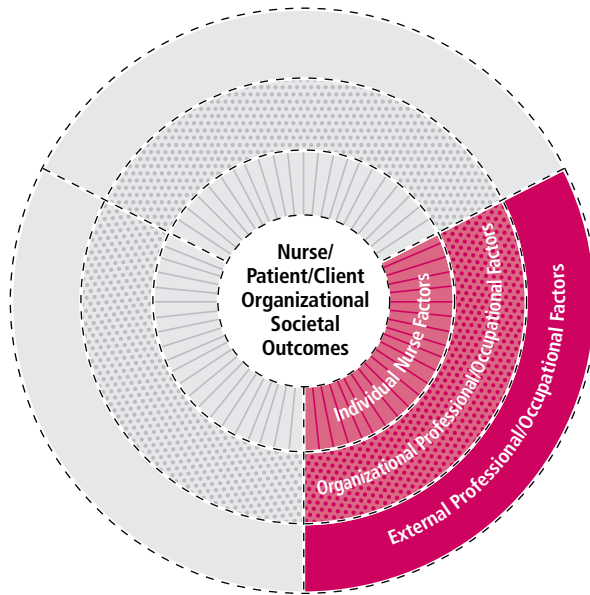
Background Context of the Guideline on Preventing Nurse Fatigue in Health Care

Patient safety and positive patient outcomes are definitive concerns for health-care organizations and health-care professionals. Nurse fatigue has been documented in the literature as contributing to negative patient outcomes and poor job performance, both of which may compromise patient care and the health of nurses.[41] Fatigue is a complex and multidimensional phenomenon and its contributing factors are evident at individual, organizational and system levels. The Institute of Medicine (IOM) calls for strategies to address the overall work environment as a comprehensive solution to mitigate and manage fatigue.[42] There is ample evidence to support the necessity to change current practices and promote a culture of safety, which recognizes nurse fatigue as an unacceptable risk to patient safety and nurse well-being, acknowledges the impact of fatigue and allows nurses to cite fatigue as a factor relevant to the inability to work.[43] Research has shown that fatigue among nurses is a critical yet somewhat unacknowledged issue.[1]

The RNAO/CNA research paper on nurse fatigue and patient safety[1] defines nurse fatigue as:

> "A subjective feeling of tiredness (experienced by nurses) that is physically and mentally penetrative. It ranges from tiredness to exhaustion, creating an unrelenting overall condition that interferes with individuals' physical and cognitive ability to function to their normal capacity. It is multidimensional in both its causes and manifestations; it is influenced by many factors: physiological (e.g. circadian rhythm), psychological (e.g. stress, alertness, sleepiness), behavioural (e.g. pattern of work, sleep habits) and environmental (e.g. work demand). Its experience involves some combination of features: physical (e.g. sleepiness) and psychological (e.g. compassion fatigue, emotional exhaustion). It may significantly interfere with functioning and may persist despite periods of rest."

The increasing acuity of patients and increased complexity of care, workload, shift work and overtime are all factors that may predispose nurses to fatigue and influence their ability to provide safe, competent and compassionate care.[41] Long shift durations significantly increase the risk for error and decrease levels of alertness and vigilance.[44] Faced with a growing demand for nursing care, an aging population and a shrinking supply of nurses, the number of hours worked by nurses is increasing.[44] As a result, hospital staff nurses are routinely scheduled for 12-hour or longer shifts, rarely take allotted breaks during their work shift and work longer than scheduled on a daily basis.[44] Nursing shortages have been reported in Canada and the United States and are now a global concern. The CNA projects a shortage in Canada of 78,000 registered nurses by 2011 and 113,000 registered nurses by 2016, if no new policies are implemented and the health patterns of Canadians continue.[45]

Nursing work that involves extreme physical, cognitive and emotional demands (e.g. nursing in medical-surgical, critical care, and peri-operative areas) has been shown to increase the likelihood of inadequate or poor sleep, anxiety, depression and absenteeism.[46] Work-related fatigue has also been associated with higher rates of injury, divorce, domestic abuse and chemical impairment.[47] Sleep durations of four hours or less have also been associated with obesity, cardiovascular disease, diabetes and depression, as well as other psychiatric disorders, while sleep deprivation and extended work hours have been associated with driving impairment.[44]

Nurse fatigue is often associated with frequent shift rotation, and is further exacerbated by a culture that expects nurses and other health-care staff to work long hours and forego sleep. Nurse fatigue is linked to patient safety risks, performance, errors, personal health, and recruitment and retention of nurses.[48] It is imperative that the critical relationship between nurse fatigue and patient safety be addressed from the perspective of creating healthy work environments for nurses as well as their employers.

Due to the urgent nature of the problem of nurse fatigue and its potential impact on the retention and recruitment of nurses, in 2010 the CNA and the RNAO together conducted a research report to raise awareness of the rising levels of nurse fatigue and provide solutions targeted at policy imperatives to better manage the issue.[1] This best practice guideline results from a recommendation made in the national report that the RNAO develop a healthy work environment best practice guideline on nurse fatigue. This guideline, which focuses on mitigating and preventing nurse fatigue, builds on the CNA/RNAO report and provides clear recommendations (based on the best evidence) for action by governments, health-care systems, organizational administrations and nurses themselves to prevent and mitigate the causes of fatigue.

Preventing and Mitigating Nurse Fatigue in Health Care: Recommendations and Discussion of the Evidence

External/System Recommendations

The following recommendations reflect physical/structural, cognitive, psychological, social, cultural, professional and occupational components of preventing and mitigating fatigue in the workplace that must be addressed at the external/system level to ensure best practice. The external systems factors contained in the recommendations include:

Physical/Structural components:

- Health-care delivery models.
- Funding.
- Legislation/Policy.

Cognitive/Psychological/Social/Cultural components:

- Consumer expectations (e.g. understanding the consequences of fatigue and the need for rest breaks).
- Changing roles of family (e.g. the need for overtime income).
- Diversity of population and health-care providers.

Professional/Occupational components

- Policies and regulations at the provincial/territorial, national and international levels that influence how organizations and individuals behave with respect to mitigating and preventing nurse fatigue in the workplace.
- Competencies and standards of practice that influence the behaviour/culture of team members.

1.0 Government Recommendations	
Recommendation	
1.1	Governments at both national and provincial levels promote the management of fatigue in health-care work environments by: a) Providing sufficient economic and human resources within the work environment to prevent and mitigate fatigue. b) Providing funding to support mandatory education for practicing nurses, nurse managers, nursing students and nurse educators about the causes of fatigue and its negative impacts on patients and nurses. c) Providing funding to ensure that adequate physical infrastructure is available to support areas for nurses to rest during scheduled breaks. This means including designated space for rest in all new building designs and providing funding to renovate existing facilities. d) Increasing nursing school enrolment and funding to so that there will be sufficient numbers of graduates in the future to ensure appropriate nurse to patient ratios in health-care settings. e) Providing financial support to nursing faculties to manage increased enrolment in graduate nursing programs.

Discussion of Evidence[a]

There is overwhelming evidence that long work hours, heavy workloads and staff shortages contribute to, and have an adverse impact on, patient/client safety.[44,49] Governments have a responsibility to ensure safe patient care through the provision of sufficient economic and human resources within the work environment to assist in the reduction of long hours and heavy workloads. It is crucial that the economic and human resource provisions be supported by investment in the development of nursing leaders to influence the required changes to the work environment that result in balanced workloads and decreased overtime.[50]

Supplementary funding for programs that address wellness education, technology and physical space should be made available to health-care organizations.[51] The particular stress and fatigue associated with nursing mean that dedicated areas for staff breaks during the work period that promote rest and relaxation will be beneficial to nurses and patients alike.[44] Unfortunately, in many current nursing work environments, staff rooms – if they exist at all – are multipurpose in nature, serving as space for shift change reporting, discussing client and family situations, or having lunch breaks. They are not conducive to quiet rest or relaxation. Strategies to provide physical space for rest must be accompanied by strategies to reduce long working hours for nurses and other health-care practitioners, to support the delivery of safe patient care.

The European Union Work Directive, which was developed in 1993 and revised in 2009, addressed the working hours of industries that operate on a 24-hour basis. The directive defined working time as: "Any period during which the worker is working at the employer's disposal and carrying out his or her activity or duties, in accordance with national laws and/or practice."[52] In October 2000, the European Court defined "on-call" as work and in 2004 mandated rest and break requirements, outlined as follows:[52]

- A minimum daily consecutive rest period of 11 hours.
- A minimum rest break of 20 minutes, when the working day exceeds six hours.
- A minimum rest period of 24 hours in each seven-day period.
- A minimum of four weeks paid annual leave.
- A maximum of eight hours of work in any 24-hour period for night workers in stressful jobs.

The 2000 Ontario Employment Standards Act (ESA) sets out the minimum standards for rest that employees and employers must follow. All other Canadian provinces, and most industrialized countries, have enacted legislation similar to this. The ESA restricts the number of hours worked to 48 per week unless there is a written agreement between the employer and employee or union, should the organization have a collective bargaining agreement. It also specifies mandatory rest periods and rules regarding overtime.[53]

In a study regarding nurses' work life and health, more than 25% of 2,273 registered nurses reported working more than 12 hours per day, which is in direct contradiction of the safe working hours guidelines developed by the Institute of Medicine.[54] Hours of work is a complex issue, particularly in health care and other sectors such as airlines. Organizations must develop and implement programs and strategies that mitigate fatigue to protect nurses and their patients/clients.

Additional evidence indicates that difficult working conditions and long work hours adversely affect the health of the nursing work force. This in turn adversely affects nurses' ability to work, and thus contributes to the nursing shortage and, at times, expedites nurses' decisions to retire from the workforce. It is imperative that the number of registered nurses be increased in order to address both current and projected shortages, and to maintain the health of the nursing workforce, which in 2008 averaged 45.1 years of age in Canada.[45]

One approach to the shortage of nurses in the workforce is to develop strategies to increase student enrolment in nursing education programs. The Canadian Nurses Association[55] estimates that at least 12,000 nursing students must graduate per year in Canada, to keep up with population growth and attrition. However, in order to increase nursing enrolment, the limited number of qualified nurse faculty members must be addressed. The Canadian Association of Schools of Nursing (CASN) estimates an annual need for 3,673 nurses with master's degrees and 650 nurses with doctoral degrees.[56] However, in 2007 only 603 master's degrees and 44 doctoral degrees were granted in Canada – 16.4 per cent and 6.8 per cent, respectively, of the required totals.[57] A focused effort is needed in order to have the numbers of faculty required to teach the identified increase in nursing students, particularly as nursing faculty are nearing retirement in increasing numbers. In 2005, 43% of nursing faculty were 50 years of age or older.[58] Further constraints to educating additional nurses that need to be addressed are: adequate physical infrastructure for additional students and faculty; funding to support nursing education; and access to practice education, including clinical placements and clinical simulation laboratories.[58]

[a]There is A1, B and C type of evidence to support this recommendation.

2.0 Research Recommendation	
Recommendation	
2.1	Researchers partner with governments, professional associations, regulatory bodies, unions, health-service organizations and educational institutions to conduct research regarding the relationship between fatigue, workload, work hours and the amount of sleep needed to provide safe patient care.
	The goals are to: (a) increase understanding of the relationship between nurse fatigue and patient safety; (b) identify measures to decrease fatigue; and (c) reduce the impact of fatigue on patient and nurse safety.
	Researchers work together across professions to achieve the above goals through studying:
	a) Hours worked, 12-hours shifts, on-call patterns and intervals between shifts worked by nurses at all levels (e.g. staff nurses, managers, nurse practitioners, nurse midwives, etc., in a variety of health-care settings).
	b) The gap in provincial infrastructure, to accurately monitor nurses' working hours, as many nurses hold positions in multiple organizations across health-care sectors.
	c) The prevalence and incidence of fatigue based on gender, marital status, lifestyle and age.
	d) The efficacy of programs to determine, assess and mitigate fatigue in health-care settings.
	e) The nature of mitigating factors influencing fatigue in the workplace, including part-time employment and nurses working multiple jobs.

RECOMMENDATIONS

Discussion of Evidence[b]

Evidence is emerging regarding the impact of nurse fatigue on quality of care and patient safety.[59] Managing patient's lives requires skilled, knowledgeable professionals who are alert to any subtle changes that may occur in their patient's conditions. Although research has shown an association between long work hours, nurse fatigue and patient safety, numerous gaps remain in the literature, most importantly, an understanding of how much sleep is necessary to provide safe patient care. There remains a paucity of research on the effects of fatigue; moreover, the biomedical perspective is not well understood. The understanding of, and ability to address, fatigue experienced by nurses would be greatly enhanced by multidisciplinary research that included nurse researchers and focused on both cognitive and physical contributors to fatigue.[60]

An interprofessional research study that includes governments and educational and health-care organizations will benefit health-care organizations by adding to the knowledge required to guide decisions and processes associated with staffing, recruitment and patient safety.[1] A number of published studies regarding medical interns, truck drivers, pilots and airline staff have recommended strategies to mitigate fatigue (e.g. nap schedules), which have been used with good effect to influence safe scheduling and staffing.[61] However, little is known about the efficacy of programs recommended to mitigate fatigue in nurses. Research questions that remain outstanding include: Can the amount of sleep necessary to provide safe patient care be quantified? Are methods used to manage and mitigate fatigue in other industries effective in the variety of settings in which nurses work?

A number of other gaps still exist: As nursing is a female-dominated profession, it is critical that research be conducted to better understand the impact of multiple caregiver roles performed by female nurses on fatigue and their work performance.[41]

There is also a paucity of literature regarding the relationship between the balanced work life of nurse managers and clinical nursing staff. One study identified that integral role that nurse managers play in creating and modeling the health-care work environment for staff nurses.[62] However, further research examining the relationship of fatigue to the leadership style of the nurse manager is required, and will benefit the development of successful approaches to address nurse fatigue. There is also a need for research that identifies the impact of fatigue on nurses, the nursing profession and patient safety.[1]

[b]There is A1, B and C type of evidence to support this recommendation.

3.0 Accreditation Recommendation	
Recommendation	
3.1	Accreditation bodies develop and implement standards in the accreditation process that address a culture of safety, including the prevention and mitigation of nurse fatigue, and incorporate the recommendations contained in this guideline.

Discussion of Evidence[c]

Accreditation Canada promotes an increased awareness of standards that direct the accreditation process. The non-profit organization is a powerful tool for accountability, and enables health-care organizations to use accreditation effectively as a roadmap for quality.[63] Such bodies as the Canadian Association of Schools of Nursing and the Ontario Council on Community Health Accreditation must be diligent in monitoring workloads and worker fatigue as a quality measurement. Therefore, it is important that they assess an organization's processes, structures and outcomes to determine whether their nursing workforce is not fatigued and able to provide safe and competent patient care.

Shift duration, complexity of care, heavy workloads and the resulting fatigue experienced by nurses due to these issues has previously been minimized by both nurses and their employers. As the need for nursing care associated with an aging population increases and the number of nurses available to care for these patients decreases, the issue of managing fatigue has become more critical.[64] Recent research has demonstrated that nurses' work schedules are associated with patient mortality and have an independent effect on patient outcomes.[65] To this end, accreditation bodies must determine which staffing pattern – based on sector and acuity – is optimal for the patient/client. The RNAO's Healthy Work Environment Best Practice Guideline entitled *Developing and Sustaining Effective Staffing and Workload Practices* provides evidence to assist with workload planning and staffing.[66]

[c]There is A1 and C type of evidence to support this recommendation

4.0 Education Recommendations	
Recommendations	
4.1	Occupational health and safety educational programs include formal and informal education sessions that address:
	a) recognizing and preventing fatigue;
	b) the factors that contribute to fatigue;
	c) the implications of nurse fatigue on patient safety, nurse well-being and organizational well-being;
	d) sleep hygiene; and
	e) utilizing self-assessment practices for fatigue.
4.2	Academic settings address the issue of nursing fatigue in the curriculum by:
	a) incorporating content related to nurse fatigue in the curriculum for nursing students, preceptors, professors and other educators; and
	b) establishing a method of evaluation that feeds back into the process to determine if student nurse fatigue and nursing faculty fatigue in the academic setting and workplace have been reduced.
4.3	Organizations and academic settings:
	a) incorporate information regarding fatigue prevention and recognition strategies into orientation programs for staff, nursing students and preceptors;
	b) enhance leadership courses to address issues related to fatigue; and
	c) promote research to assist health-care organizations in implementing and evaluating strategies to address nurse fatigue.

Discussion of Evidence[d]

Nurses and other health-care practitioners do not always recognize their own levels of fatigue, or the link between fatigue, errors and resulting harm to themselves and their patients. Fatigue may be brought to the attention of those experiencing it, but is often shrugged off as the norm and seen as heroic. Within the culture of nursing, going the extra mile is encouraged, and statements acknowledging fatigue are, at times, viewed as unreasonable and unsupportive.

Education is key to a comprehensive fatigue management program. Most importantly, nurses should be made aware that fatigue is a contributing factor to error. Fatigue countermeasures can be effective in raising awareness of and preventing nurse fatigue.[67-69] Fatigue education programs should include information on sleep science, risks associated with fatigue, circadian rhythm, mitigating factors that promote healthy wake and sleep patterns and approaches to optimization of performance.[1,68,70]

Educational programs regarding fatigue in health-care and academic settings are crucial to minimize potential for fatigue-related risk and injury in nurses and patients. Trinkoff and colleagues[65] conducted a study among 633 nurses in a hospital setting to determine if their 12-hour work schedule resulted in increased patient mortality; their findings indicated a significant relationship between mortality, staffing schedules and hours worked. "Long work hours pose one of the most serious threats to patient safety, because fatigue slows reaction time, decreases energy, diminishes attention to detail, and otherwise contributes to errors."[71]

Education programs should not only identify the risks of fatigue, but also the contributing factors and how to address them to both prevent and mitigate fatigue. Nurses and nursing students must be able to identify and recognize these risk factors, and understand how to prevent and manage them on both personal and professional levels.

Professional contributing risk factors for fatigue include:

- on-call hours;
- mandatory overtime;
- a work week that is more than 40 hours;
- shifts that are more than 12 hours;
- inadequate rest between shifts;
- rotating shifts within the work week;
- working while sick; and
- insufficient nursing staff and or ancillary staff.

Personal contributing risk factors for fatigue include:[59]

- working more than one job;
- working voluntary overtime;
- responsibilities of home and family;
- age;
- overall physical and mental health; and
- hours of sleep.

Implications regarding patient safety related to fatigue were identified in a study by Rogers and colleagues,[59] in which 393 nurses reported working shifts that were longer than 12 hours; during these shifts the error rate tripled. Of the 199 errors and 213 near errors reported in the study:

- 58% of errors and 56% of near errors were related to medication administration.
- 18% were procedural errors.
- 12% were charting errors.
- 7% were transcription errors.
- 30% of nurses reported making at least one error and 32% reported making at least one near error.

Education regarding fatigue and its successful mitigation must be focused on direct care nurses, nurse managers and senior management team members who are responsible for strategic planning and day-to-day decision-making. This would serve to increase awareness of symptoms of fatigue and assist in the development of fatigue management plans, staffing models that mitigate fatigue and provision of sufficient human resources necessary for patient safety.[70]

Employers should provide continuing education to all staff to support the efficacy of a successful fatigue management program in the workplace, with a particular emphasis on middle nurse managers and charge nurses. Managers and those responsible for staffing and scheduling must be educated about the importance of incorporating fatigue prevention initiatives into the organization's daily operations. Indeed, managers and others in leadership roles also experience unsafe levels of fatigue, the effects of which (i.e. irritability, inability to concentrate, impaired judgment) can affect the manager nurse relationship and lead to further tension and stress.[72]

In 1999, the Federal Aviation Administration reported that fatigue is not "a mental state that can be willed away or overcome through motivation or discipline. Fatigue is rooted in physiological mechanisms related to sleep, sleep loss and circadian rhythm." Indeed, humans' circadian rhythm has two times of maximum sleepiness: between the hours of 3:00 o'clock and 5:00 o'clock a.m., and between 3:00 o'clock and 5:00 o'clock p.m. During this time, the human body experiences a down period and shift workers often experience a debilitating need to sleep.[73]

In the aviation industry, flight crews are educated regarding the dangers of fatigue and increased potential for human error.[74] They are taught to manage fatigue by asking a crew member to monitor them; as well, their workload may be reallocated. The aviation industry could serve as a model for health care with respect to creating a culture where nurses feel comfortable communicating their needs regarding fatigue-related monitoring.

Students must be educated regarding the effects of fatigue and how to mitigate it both in their busy academic life and as newly graduated nurses. Education must include guidance regarding next steps if mitigation efforts fail and what resources may be available to assist them. Current anecdotal evidence shows that students report being more fatigued once they start their clinical experience, which include night shifts, juggling assignments, part-time work and attending classes. Educators should provide opportunities for students to learn how to balance competing priorities. Moreover, course development and academic expectations should allow sufficient rest time and manageable workloads for students.[68]

Effective educational tools regarding fatigue should include the importance of sleep, maintenance of good health and techniques to mitigate unsafe levels of fatigue.[59] Educational resources should be disseminated through a variety of means, including the internet, pamphlets, booklets, posters and other creative means necessary to achieve access, awareness and uptake of content.[68]

Although education is a major component of a multi-pronged approach toward a culture of safety, education alone will not address the concerns of nurses who are experiencing fatigue. Thus, it is critical that mitigating and preventing fatigue be role modelled by an organization's leaders.

[d]There is A1 and C type of evidence to support these recommendations.

RECOMMENDATIONS

RECOMMENDATIONS

5.0 Nursing Professional / Regulatory / Unions Recommendations	
Recommendations	
5.1	Professional associations, regulatory bodies and unions promote practices that result in preventing and mitigating fatigue for nurses and other health-care professionals that contribute to healthy work environments.
5.2	Professional associations and unions collaborate, advocate for and promote a workplace culture that recognizes the impact of fatigue on both patient safety and nurses' overall health and well-being.
5.3	Nursing regulatory bodies develop standards of practice that recognize the impact of fatigue on patient safety and nurses' overall health and well-being.
5.4	Professional associations, regulatory bodies and unions promote the education of nurses regarding their professional responsibility related to managing personal fatigue and mitigating the impact of fatigue on safe, quality patient care.
5.5	Professional associations, regulatory bodies and unions advocate for safe work environments with appropriate staffing models that include adequate registered nursing staffing to address workload, overtime issues and scheduling practices that minimize fatigue.
5.6	Professional associations, regulatory bodies and unions support and encourage a healthy work environment for all health-care professionals.
5.7	Regulatory bodies set practice standards and guidelines applicable to nurses and employers to ensure quality practice environments.
5.8	Unions, professional associations and nursing regulatory bodies encourage nurses and organizations to identify, document and collaboratively address unsafe staffing conditions.

Discussion of Evidence[e]

Recommendations for all health-care professionals, organizations and regulators are based on the fact that policy-making, standard-setting and politically active bodies play an integral role in promoting safe work environments, appropriate staffing models and scheduling practices that recognize the impact of fatigue on nurses and other health-care professionals.[66]

Providing optimal patient outcomes is the primary goal of health-care providers. When issues such as fatigue threaten this goal, an opportunity arises for professional associations and regulatory bodies to collaborate and seek a solution. Professional associations have a responsibility to ensure that nurses are aware of their ethical responsibilities to provide safe care.[75] Ethical considerations regarding fatigue include decisions to work prolonged hours, or identifying insufficient off-duty time between shifts.

Professional associations, regulatory bodies and unions are in a position to promote a workplace culture that recognizes the impact of fatigue on patient safety and nurses' overall health and well-being. "Research has demonstrated that professional associations and unions can encourage staffing systems, and the development of policies and procedures, that foster a safe and healthy environment, including appropriate staff mix and work design related to patient acuity, flexible scheduling and policies that promote institutional loyalty and retention."[1]

[e]There is A1, B, C, D and D1 type of evidence to support these recommendations.

Organization Recommendations

The following recommendations are organized using the Healthy Work Environments framework, and reflect the physical/ structural, cognitive, psychological, social, cultural, professional and occupational components of preventing and mitigating fatigue in the workplace that must be addressed at the external/system level to ensure best practice. External systems factors identified in the various components include:

Physical/Structural components:

- physical characteristics and environment of the organization (e.g. sleep rooms for all staff);
- organizational structures and processes created to respond to the physical demands of work (e.g. decision-making process regarding overtime and scheduling);
- leadership support;
- staffing practices; and
- occupational health and safety policies.

Cognitive/Psychological/Social/Cultural components:

- organizational climate, culture and values;
- cultural norms, especially those that foster support, trust, respect and safety;
- communication practices;
- labour /management relations; and
- culture of continuous learning and support.

Professional/Occupational components:

- characteristics of the nature and role of nursing within the organization, including organizational policies that influence scope of practice, level of autonomy and control over practice; and
- nurse intra- and interprofessional relationships within the organization.

6.0 Organization Recommendations	
Recommendations	
6.1	Organizations and academic centres promote a culture that recognizes nurse fatigue as a risk to patient and nurse safety that must be addressed by comprehensive fatigue prevention and management programs that include: a) educating staff and leadership on fatigue management; b) developing mechanisms to document fatigue and analyze its relationship to overtime hours worked, medication errors, and patient and staff outcomes; c) providing fatigue assessment strategies through orientation and other professional development opportunities; and d) support services, such as wellness initiatives and Employee Assistance Programs, to assist with contributors to fatigue.
6.2	Organizations plan, implement and evaluate staffing and workload practices that create adequate staffing to reduce workload, in order to mitigate nurse fatigue and ensure nurse and patient safety.
6.3	Organizations implement a safe scheduling policy that includes no more than 12 hours scheduled within a 24-hour period, and no more than 50 hours scheduled per seven-day work week. a) Scheduling for nights should not involve more than three consecutive 12-hour night shifts and should include a longer interval of "off duty" time between blocks of shifts to recover.
6.4	Organizations develop and implement a policy – in consultation with nursing unit councils, the occupational health/ wellness department, scheduling committees, unions and regulatory bodies – that sets limits regarding the amount of overtime worked by nurses.
6.5	Organizations develop a policy that supports rest and sleep periods during scheduled breaks. Organizations furthermore create a safe and secure area where nurses can have uninterrupted (excluding emergencies) rest and sleep periods. Individual nurse retain professional accountability and responsibility to respond to emergencies.

Discussion of Evidence[f]

Nurse fatigue is a safety risk for nurses and patients, which organizations can greatly influence and mitigate. Health-care organizations must develop a culture of safety that reinforces the establishment of infrastructures and work processes to support the use of fatigue countermeasures in health care.[76] Research has demonstrated that nursing fatigue has a negative impact on medication errors, performance of procedures, documentation and transcription.[59] Furthermore, Dorrian and colleagues studied a cohort of Australian hospital nurses, and reported that less sleep led to the increased likelihood of error, the decreased likelihood of noticing a colleague's error and drowsy driving.[51]

In addition, health-care organizations must establish a comprehensive fatigue management policy and program to include the following components:[1,77]

Fatigue management policy	Fatigue management program
■ Scheduling practices	■ Fatigue education for staff and management
■ Maximum hours of work per day, per week and on-call	■ Audits of fatigue reports and links to overtime
■ Infrastructure support for space for off-duty rest or sleep	■ Audits of overtime and on-call hours
■ Processes to document and report fatigue	■ Data linked to fatigue and errors
	■ Data linked to staff turnover due to fatigue
	■ Health promotion initiatives for sleep hygiene

Strategies are necessary to create practice environments and cultures that recognize the dangers and harmful effects of fatigue as unacceptable safety risks.[43] The key to creating a culture that is educated and armed to mitigate fatigue lies with decision-makers, professional organizations and individuals who experience fatigue.[68] It is critical that, in addition to a supportive culture, appropriate financial resources be allocated to allow organizations to employ sufficient numbers of nurses to mitigate fatigue and provide safe patient care.[68]

Organizations should sustain interventions that are effective in promoting patient safety – including policies on mitigating and preventing fatigue – and increasing knowledge transfer and uptake related to patient safety and nurses' well being.[1] When policies and programs are in place regarding fatigue – including mandatory reporting of incidents and absenteeism related to fatigue – there is greater awareness of both the dangers of fatigue and the resources available to prevent and mitigate it.[78] Organizations must consider it a strategic priority to change current practices to allow nurses to cite number of hours worked and associated fatigue as a factor for inability to work.[68]

Grogan and colleagues[69] discussed the need for nurses to be aware of and assess their own fatigue levels, to determine their fitness for duty. Nurses must be provided with self-assessment tools to determine their level of fatigue before accepting overtime shifts or when feeling fatigued.

Appropriate staffing of nurses can be used as a strategy to aid in the mitigation and management of nursing fatigue. Organizations can have a positive influence on nursing fatigue by being attentive to safe staffing and scheduling practices. Understaffing and the increased complexity of work were identified in a study by Duxbury and colleagues[79] as contributors to work overload. Work overload was also identified as a contributing factor to fatigue.[79] Another contributing factor to nursing fatigue is working more than 12 consecutive hours.[59] Moreover, working more than 12 hours in a 24-hour period, and more than 60 hours in a seven-day period, increases the likelihood of error.[42,68] 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.[59] Consequently, organizations must identify policies and practices in their environments that contribute to nursing fatigue and create unsafe work situations.[68] Practices such as mandatory overtime (excluding emergency situations) should be reviewed. Although nurses report feeling less fatigued when working voluntary vs. mandatory overtime hours, current literature notes little difference in the incidence of errors and "near misses." Olds and Clark[80] suggested that the number of hours worked and voluntary overtime have the strongest relationship to medication errors and needle stick injuries. This study confirms prior findings that increased work hours – whether voluntary or mandatory – raise the likelihood of adverse events and errors.[80]

Data collected from two randomly selected national samples of full-time hospital staff nurses in the United States revealed that approximately 75% of hospital nurses now work 12-hour shifts.[59] Even though nurses were employed in 12-hour shift positions, almost one-half (41%) of the work shifts were scheduled for durations greater than 12 hours, and 4,650 shifts (44%) exceeded 12 consecutive hours. Almost one-quarter of respondents (23%) reported working 16 or more consecutive hours at least once during the four-week study period, suggesting that longer shifts are not confined to rare emergency situations. Of particular concern were the number of shifts scheduled for 20 or more consecutive hours (n=78), and the number of actual shifts worked that exceeded 20 consecutive hours (n=118). The longest shift worked was 23 hours and 57 minutes.[59]

In the first sample, errors were three times more likely to occur when hospital staff nurses worked 12 hour shifts or longer vs. eight-hour shifts (odds ratio=3.13, p=0.001), and were two times more likely to occur when nurses worked overtime (odds ratio=2.07, p=0.004). These findings were supported in a second sample of critical care nurses, in which almost two-thirds reported struggling to stay awake at work at least once, despite frequent interactions with other health-care professionals and the typical high activity levels found in most critical care units. In both samples, nurses who reported drowsiness or falling asleep on duty obtained significantly less sleep than nurses who were able to remain alert and vigilant while providing patient care. They also made significantly more errors than nurses who were able to remain alert throughout their work shift, with the risk for error increasing by 7% to 9% for each hour of sleep lost.[46] As previously identified, fatigue can result from a variety of causes (e.g. illness, a vigorous workout, or a period of prolonged concentration). Thus, it is important that the effects of fatigue associated with extended work shifts, and the relationship between work schedules and nurse and patient safety, be managed consistently through organizational policies and related practices and leadership.

An effective scheduling policy should include principles regarding shift work that will promote health and enhance work life balance.[68] Policy development and practices regarding scheduling, including adequate off-duty periods, minimization or elimination of overtime and incorporation of circadian principles to hospital scheduling, should be implemented by health-care organizations.[68]

Occupational policies and health promotion initiatives (e.g. sleep hygiene advice) will assist in developing and promoting skills in mitigating fatigue. The provision of support at workplaces in the form of time and space for rest/nap periods for employees impaired with fatigue demonstrates an organization's recognition of the need for rest among all health-care practitioners and commitment to prevention and mitigation of nurse fatigue.

Researchers at Flinders University, in Adelaide, Australia, reported encouraging results regarding the use of naps to manage fatigue: Subjects waking from a 10-minute nap demonstrated an immediate, significant increase in alertness and mental performance that lasted for at least one hour afterwards. In contrast, a 30-minute nap failed to produce a similar immediate increase; however, there an increase in alertness was noted approximately 30 minutes after the half-hour nap.[81]

While strategic or planned naps have been shown to be beneficial to manage fatigue, nurses often find it emotionally difficult to take planned naps on a regular basis. This may account for the decrease in use of strategic naps at work. Research further validates the importance of addressing work culture issues that prohibit the use of planned naps, and calls for a paradigm shift among nurses and administrators for these fatigue countermeasures to be successful in health care.[76]

The most recent research on nurse fatigue suggests the following fatigue countermeasures: (a) provision of adequate staffing to enable nurses to take breaks; (b) completely relieved breaks and meal periods; (c) the use of strategic naps during breaks or meal periods; (d) establishment of sleeping accommodations for nurses' use with administrative support, such as a sleep recliner and a timer; and (e) suspension of organizational policies that result in termination for sleeping on duty.[76] Obtaining sufficient sleep before beginning a shift and judicious use of caffeine were also identified as fatigue countermeasures. Organizations must establish guidelines and training for use of evidence-based fatigue countermeasures and provide specific support for individual nurses, where needed, to manage the contributing factors to fatigue.[68]

ᶠThere is A, A1, B, and C type of evidence to support these recommendations.

7.0 INDIVIDUAL/TEAM RECOMMENDATIONS	
Recommendations	
7.1	All employees, physicians, volunteers and students should: ■ perform a self-assessment prior to starting and during a work shift to ensure their fitness to work and provide safe provision of care; ■ ensure adequate recovery time prior to starting a shift; ■ take entitled breaks and support colleagues to do the same; and ■ limit overtime hours worked.
7.2	All employees, physicians, volunteers and students should take responsibility for identifying and reporting unsafe conditions (e.g. fatigue) in accordance with professional practice standards and hospital policy, without fear of reprisal.
7.3	All employees, physicians, volunteers and students should take responsibility for maintaining optimal personal health and well-being, including: ■ participating in physical activity outside the work setting; ■ ensuring adequate nutritional intake; ■ ensuring adequate rest and sleep between shifts; ■ communicating shift preference where there are known personal impacts related to specific shift patterns; and ■ responsible self-scheduling in settings that participate in self-scheduling.

RECOMMENDATIONS

Discussion of Evidence[g]

The nuclear energy and aviation industries have recognized the significant impact of worker fatigue on safe operations[82] and have developed safeguards to mitigate the harm that can result from operator fatigue.[82] However, nursing fatigue is often conceptualized as a consequence of poor scheduling, voluntary and involuntary overtime, personal shift preference and shift rotation.[83] Nurses, therefore, play a crucial role in mitigating fatigue with respect to considering the impact that multiple jobs have on their fatigue levels, and practicing constant and consistent vigilance regarding their fitness to practice.[68]

As well as recognizing and monitoring their own fatigue, nurses must likewise be prepared to approach colleagues who may be too fatigued to practice safely. Signs of fatigue include mood changes, and slowed responses and reflexes.[76] It has been posited that slowed reflexes may account for the higher incidence of motor vehicle accidents involving health-care workers on their way home from work.[68,84] Indeed, fatigued individuals have been documented as having 2.5 more fatigue-related accidents than those who are considered to have gotten sufficient sleep.[85]

Sleep problems tend to occur with aging; thus, these problems may have significant health ramifications for nurses as their average age is increasing, compounded with an already stressful job. The relationship between fatigue and stress at work has been shown to influence unhealthy behaviours, including the use of sedatives and alcohol.[77] Fundamentally, when nurses are fatigued, they are less able to provide the quality of care that their patients, and they themselves, expect.[68,86,87]

Nurses should perform a self-assessment regularly to evaluate their personal wellness and suitability to perform optimally.[77] It is the responsibility of the individual nurse to assess and report to their supervisor their inability to practice. Nurses have a professional and ethical responsibility to report and address concerns regarding fatigue and patient safety.[75,88] Several

validated self-assessment tools are available, including the Occupational Fatigue and Exhaustion Recovery Scale and the Pittsburgh Sleep Quality Index (Appendix D).

"The health and well-being of the health-care workforce and the quality of the health-care work environment both have a profound impact on the effectiveness and efficiency of health service delivery," as well as on employee health.[77] Recent research has demonstrated a relationship between long work hours and increased risk of diabetes, heart disease, poor quality sleep and injury.[89]

It is important, then, for nurses to enhance and maintain their personal wellness by practicing the following health promotion behaviours:[77]

- assess fatigue level and arrive at work only when fit to work;

- advocate for onsite child care resources;

- access health and wellness programs;

- consider personal preference for shifts i.e. where offered, self-schedule responsibly;

- take breaks and vacations;

- access resources provided by employers, e.g. Employee Assistance Programs for help with work or home stressors;

- get adequate sleep and understand the consequences of sleep deprivation and disruption of the circadian rhythm;

- participate in exercise and physical fitness programs;[90] and

- ensure adequate rest and recovery time between shifts.

The Canadian Centre for Occupational Health and Safety recommends the following coping strategies for shift workers affected by fatigue:[91]

- keep a regular eating schedule;

- establish a routine that is appropriate for the shift you are on: in this way, you can control your body's internal clock;

- maintain a balanced and nutritious diet;

- avoid a high-protein, high-fat meal before going to bed;

- limit intake of stimulants, e.g. caffeine, sugar;

- set aside at least one meal or activity per day with family or friends to avoid social isolation;

- maintain the same sleep, work and leisure time sequence on days off, regardless of the shift worked;

- sleep in a completely darkened room; and

- practice relaxation techniques to reduce stress.

Mitigating unsafe levels of nurse fatigue requires a collaborative approach. Nurse can contribute to a culture of safety individually by taking responsibility for personal work and sleep habits, taking advantage of education opportunities, participating in awareness among nurses about the dangers of fatigue and accessing resource that mitigate fatigue.

[g]There is A, B, and D type of evidence to support these recommendations.

Evaluation and Monitoring of the Guideline

Organizations implementing the recommendations in the Healthy Work Environments *Preventing and Mitigating Nurse Fatigue in Health Care Best Practice Guideline* are encouraged to consider how the implementation and its impact will be monitored and evaluated. The following table, based on the *Conceptual Model for Healthy Work Environments* illustrates some examples of indicators for monitoring and evaluation.

Level of Indicator	Structure	Process	Outcomes	Measurement
Objective	To evaluate the supports that promote an environment that is conducive to preventing nurse fatigue.	To evaluate nurse fatigue prevention and management processes.	To evaluate the impact of implementation of the guideline recommendations at all levels.	To measure and monitor indicators of structures, processes and outcomes.
Organization/ Unit	Organizations have incorporated pertinent recommendations within this guideline in collaboration and consultation with relevant professional associations, regulatory bodies, unions and academia. Structures consistent with recommendations related to organizational supports that mitigate fatigue are evident through: ■ scheduling guidelines and practices; ■ policies related to number of hours worked and number of overtime hours worked; and ■ practices for reporting issues related to fatigue that are non-punitive.	Communication processes have been established to share scheduling practices, including guidelines for over-time practices. Education has been provided to nurses and managers regarding the implications of fatigue and potential negative outcomes. Development of scheduling policies that address factors related to fatigue and nurse and patient safety. Staff and managers have been educated regarding policy and practice changes to support fatigue scheduling practices that reduce fatigue in the workplace.	■ Reduced absenteeism. ■ Reduced sick time. ■ Improved employee retention. ■ Increased safety. ■ Increased patient and nurse satisfaction.	Measurement of Health & Human Resources statistics on sick time, staff turnover and absentee reporting that links to fatigue and patient safety (QWQHC charter) Safety audits

Level of Indicator	Structure	Process	Outcomes	Measurement
Individual	Nurse/Team: Education programs developed for the nursing team related to scheduling policies and the link to fatigue. Support for nurses in all roles related to developing knowledge regarding assessment, management and mitigation of fatigue.	Communication mechanism for education established. Curriculum for educational sessions developed. Participate in self-assessment through organizationally adapted fatigue assessment tools. Outline personal strategies to assess and minimize fatigue via annual College of Nurses of Ontario Reflective Practice or other jurisdictional regulatory body Complete work-life balance plans*	Reduction of fatigue, and fatigue related effects. Improved job satisfaction, improved collegial relations and team-building. Positive staff survey results. Staff satisfaction surveys and exit interviews completed, as appropriate.	Documentation regarding attendance at education sessions. Impact of educational sessions measures. Funds provided for ongoing education. Number of staff who attend educational sessions monitored and recorded.
Patient/Client	Appropriate scheduling resources and supports and sufficient practitioners scheduled to ensure the delivery of safe patient care.	Ongoing monitoring of patient safety outcomes, such as medication errors and patient incidents, and analysis of impact of fatigue as an associated factor. Mechanisms to access information/feedback from patients, i.e. patient satisfaction survey.	Increased patient satisfaction. Improved patient safety. Reduction in patient errors, including medication errors and patient incidents. *Dependent on organization`s implementation of recommendations.	Patient safety measures. Patient satisfaction surveys.

Dependent on organization's implementation of recommendations.

Process for Reviewing and Updating the Healthy Work Environments Best Practice Guidelines

The RNAO proposes to update the Healthy Work Environments Best Practice Guidelines as follows:

1. Each healthy work environments best practice guideline will be reviewed by a team of specialists (Review Team) in the topic area, to be completed every five years following the last set of revisions.

2. During the period between development and revision, RNAO Healthy Work Environments project staff will regularly monitor for new systematic reviews and studies in the field.

3. Based on the results of the monitor, project staff may recommend an earlier revision plan. Appropriate consultation with a team composed of original panel members and other specialists in the field will help in form the decision to review and revise the guideline earlier than the five-year milestone.

4. Six months prior to the five-year review milestone, project staff will commence the planning of the review process by:

   a) Inviting specialists in the field to participate in the Review Team. The Review Team will be composed of members from the original panel as well as other recommended specialists.

   b) Compiling feedback and questions encountered during the dissemination phase, as well as other comments received from implementation site representatives regarding their experiences.

   c) Compiling relevant literature.

   d) Developing a detailed work plan with target dates and deliverables.

5. The revised guideline will undergo dissemination based on established structures and processes.

RECOMMENDATIONS

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REFERENCES

Appendix A: Glossary of Terms

Correlation Studies: Studies that identify the relationship between variables. There can be three kinds of outcomes: no relationship, positive correlation and negative correlation.

Critical Review: A scholarly article based on a review of the literature on a particular issue or topic, which also includes the author's considered arguments and judgments about it.

Education Recommendations: Statements of educational requirements and approaches/strategies for the introduction, implementation and sustainability of a best practice guideline.

Expert Opinion: The opinion of a group of experts based on knowledge and experience, and arrived at through consensus.

Healthy Work Environments: A healthy work environment for nurses is a practice setting that maximizes the health and well-being of nurses, quality patient/client outcomes and organizational performance.

Healthy Work Environment Best Practice Guidelines: Systematically developed statements based on best available evidence to assist in making decisions about appropriate structures and processes to achieve a healthy work environment.[92]

Integrative Reviews: The integrative process includes the following components: (1) problem formulation, (2) data collection or literature search, (3) evaluation of data, (4) data analysis, and (5) interpretation and presentation of results.

Meta-analysis: The use of statistical methods to summarize the results of several independent studies, thereby providing more precise estimates of the effects of an intervention or phenomena of health care than those derived from individual studies.[93]

Nurses: Refers to registered nurses, licensed practical nurses (referred to as registered practical nurses, in Ontario), registered psychiatric nurses and nurses in advanced practice roles, such as nurse practitioners and clinical nurse specialists.

Organizational Recommendations: Statements regarding the conditions required for a practice setting that enables the successful implementation of a best practice guideline. The conditions for success are largely the responsibility of the organization.

Patient/Client: Recipient(s) of nursing services. This includes individuals, (family member, guardian, caregiver) families, groups, populations or entire communities. In education, the client may be a student; in administration, the client may be staff; and in research, the client is a study participant.[94,95]

Practice Recommendations: Statements of best practice directed toward the practice of health-care professionals that are ideally evidence-based.

Qualitative Research: A method of data collection and analysis that is non-quantitative. Qualitative research uses a number of methodologies to obtain observational data, including interviewing participants in order to understand their perspectives, world view or experiences.

System Recommendations: Statements of conditions required to enable the successful implementation of a best practice guideline throughout the health-care system. The conditions for success are associated with policy development at a broader research, government and system level.

Systematic Review: Application of a rigorous scientific approach to the preparation of a review article.[96] Systematic reviews establish where the effects of health-care are consistent, and where research results may be applied across various populations and health-care settings, and where differences in treatment and effects may vary significantly. The use of explicit, systematic methods in reviews limits bias (systematic errors) and reduces chance effects, thus providing more reliable results upon which to draw conclusion and make decisions.

APPENDICIES

Appendix B: Guideline Development Process

The RNAO, with funding from the Ontario Ministry of Health and Long-Term Care, and in partnership with Health Canada, has embarked on a multi-year project of healthy work environments best practice guidelines development, evaluation and dissemination that will result in guidelines developed by expert panels. This guideline was developed by an expert panel convened by the RNAO, conducting its work independently of any bias or influence from funding agencies.

The expert panel consisted of nurses with expertise in practice, research, policy, education and administration, representing a wide range of nursing specialties, roles and practice settings.

The panel undertook the following steps in developing the best practice guideline *Preventing and Mitigating Nurse Fatigue in Health Care*:

- The scope of the guideline was identified and defined through a process of discussion and consensus in a Scope and Purpose statement.
- Inclusion/exclusion parameters were determined, based on the purpose and scope of the guideline.
- Research questions were developed by the panel.
- An internet search of published guidelines related to nurse fatigue and fatigue was completed and yielded no results.
- Search terms relevant to preventing and mitigating nurse fatigue in all roles were sent to the University Health Network Health Search librarian, to conduct a broad review of the literature.
- The resulting citations and abstracts from the database were sent to the RNAO Program Manager for review. It was determined that applicable literature was being collected and the librarian continued to search various databases.
- The list of included citations and abstracts was emailed to the research assistant for review. The research assistant reviewed the list and determined which articles should be pulled and printed for the data-extraction process.
- All included articles were reviewed to determine their quality, using appropriate assessment tools.
- A detailed summary was developed by the research assistant and submitted to the panel.
- The panel was divided into subgroups based on the organizing framework for developing a Healthy Work Environment: (a) system or external level; (b) organizational level; and (c) individual level.
- The panel reviewed the report.
- The subgroups organized the concepts and content of the guideline using the Healthy Work Environment framework.
- Supplemental literature was sourced by the panel.
- Through a process of discussion and consensus, preliminary recommendations were developed based on the evidence contained in the literature.
- Preliminary drafts of the BPG were reviewed by the expert panel.
- A draft of the BPG was sent out for stakeholder review.
- The subgroups reviewed and discussed all stakeholder feedback.
- Recommendations and evidence were finalized.
- The expert panel reviewed and approved the final document.

Appendix C: Process for Systematic Review of the Literature on Preventing and Mitigating Nurse Fatigue in the Workplace

1. A broad review of the literature, using keywords associated with the definition of fatigue in the workplace, was entered into the following databases:

- CINAHL
- Medline
- Embase
- ERIC
- PsycINFO
- PubMed

The definition of fatigue used in the search was as follows:

"A subjective feeling of tiredness (experienced by nurses) that is physically and mentally penetrative. It ranges from tiredness to exhaustion, creating an unrelenting overall condition that interferes with individuals' physical and cognitive ability to function to their normal capacity. It is multidimensional in both its causes and manifestations; it is influenced by many factors: physiological (e.g. circadian rhythms), psychological (e.g. stress, alertness, sleepiness), behavioural (e.g. pattern of work, sleep habits) and environmental (e.g. work demand). Its experience involves some combination of features: physical (e.g. sleepiness) and psychological (e.g. compassion fatigue, emotional exhaustion). It may significantly interfere with functioning and may persist despite periods of rest."[1]

2. Inclusion/exclusion criteria were:
- English-only literature.
- Published within the last 10 years.
- Research papers that:
  - Defined and described forms of workplace fatigue.
  - Identified antecedents and consequences, and strategies or assessments to recognize workplace fatigue.
  - Described fatigue in all domains of nursing.
  - Defined and described fatigue in the airline and other industries.
  - Identified strategies or interventions to identify, manage and mitigate fatigue.
  - Identified education-related fatigue.
- Literature type:
  - Systematic, primary, meta-analysis.
  - Published, unpublished and grey literature.
  - Research design: experimental, quasi-experimental, observational, descriptive, co-relational, and critical reviews.

3. Search terms identified included:

■ Nurses and fatigue	■ Patient acuity and fatigue
■ Patient acuity and tiredness	■ Nurses and exhaustion
■ Correlation between fatigue and error	■ Fatigue management
■ Mitigating fatigue	■ Group cultures and fatigue
■ Group norms and fatigue	■ Fatigue guidelines
■ Peer pressure and fatigue	■ Patient acuity and fatigue
■ Injury and fatigue	■ Public health nurses and fatigue
■ Homecare nurses and fatigue	■ Health care and fatigue
■ Occupational health and fatigue	■ Shift work and fatigue
■ Airline industry and fatigue	■ Workplace fatigue
■ Exhaustion	■ Tired
■ Absenteeism and fatigue	■ Absenteeism
■ Aging nurse and fatigue	■ Sleep deprivation
■ Sleep pattern disturbances	■ Irritability and fatigue
■ Partial sleep deprivation	■ Insufficient sleep deprivation
■ Personal responsibility and nursing	■ Moral distress
■ Fragmented sleep	■ Restorative sleep
■ Overtime and nurses	■ Overtime and fatigue
■ Patient safety and nurse fatigue	■ Patient safety
■ Adverse events and fatigue	■ Errors and fatigue
■ Job experience and fatigue	■ Job satisfaction and fatigue
■ Job satisfaction and nurses	■ Job satisfaction
■ Work environment and fatigue	■ Work environment
■ Fatigue management, fatigue symptoms, assessing fatigue	■ Self-scheduling

APPENDICIES

4. The review considered nurses in all domains (clinical practice, administration, education and research) and all sectors.

The search strategy sought to find published and unpublished studies and papers limited to the English language. An initial, limited search of CINAHL and Medline was undertaken, followed by an analysis of the text words contained in the title and abstract, and of the index terms used to describe the article. A second-stage search, using all identified keywords and index terms, was then undertaken using the search terms listed above.

5. Studies identified during the database search were assessed for relevance to the review based on the information in the title and abstract.

All papers that appeared to meet the inclusion criteria were retrieved and assessed once again for relevance to the review objective.

6. Identified studies that met inclusion criteria were grouped into type of study (e.g. qualitative, quantitative, non-research), then into common themes such as experimental, descriptive, etc.).

7. Papers were assessed by two independent reviewers for methodological quality prior to inclusion in the review, using an appropriate critical appraisal instrument.

Non-research papers were included if they discussed strategies to manage fatigue. Disagreements between the reviewers were resolved through discussion and, if necessary, with the involvement of a third reviewer.

Results of Review

A total of 82 papers – quantitative, experimental, qualitative and textual in nature – were included in the review. The majority of papers were descriptive and examined the following topics: importance of sleep; sleep deprivation and the circadian rhythm; relationship between fatigue, shift work, long hours of work; overtime hours; and particular outcomes, such as errors in patient care, health issues, absenteeism and job satisfaction.

Appendix D: Tools

Occupational Fatigue Exhaustion Recovery (OFER 15) Scale

These statements are about your experience of **fatigue and strain** at work and home over the last few months. Circle a number from 0 to 6 – "Strongly Disagree" to "Strongly Agree" – which best indicates your response.

	Strongly disagree	Disagree	Slightly disagree	Neither agree or disagree	Slightly agree	Agree	Strongly agree
1. I often feel I'm 'at the end of my rope' with my work.							
2. I often dread waking up to another day of my work.							
3. I often wonder how long I can keep going at my work.							
4. I feel that most of the time I'm just "living to work".							
6. After a typical work period I have little energy left.							
7. I usually feel exhausted when I get home from work.							
8. My work drains my energy completely every day.							
9. I usually have lots of energy to give to my family or friends.							
10. I usually have plenty of energy left for my hobbies and other activities after I finish work.							
11. I never have enough time between work shifts to recover my energy completely.							
12. Even if I'm tired from one shift, I'm usually refreshed by the start of the next shift.							
13. I rarely recover my strength fully between work shifts.							
14. Recovering from work fatigue between work shifts isn't a problem for me.							
15. I'm often still feeling fatigued from one shift by the time I start the next one.							

OFER-CF; Chronic Fatigue subscale comprises items 1–5 inclusive

OFER-AF; Acute Fatigue subscale comprises items 6–10 inclusive.

OFER-IR; Intershift Recovery subscale comprises items 11–15 inclusive.

Items should be included in test instruments in random order

Scoring:

Items 9, 10, 11, 13 & 15 should be reverse scored.

OFER-CF = sum (item 1–5 scores)/30 x 100

OFER-AF = sum (item 6–10 scores)/30 x 100

OFER-IR = sum (item 11–15 scores)/30 x 100

Produces comparable values between 0–100 for each subscale. Higher scores on each computed subscale indicate 'more' of the subscale construct.

For comparative purposes, cut-points into levels of 'low, low/moderate, moderate/high and high' on each subscale may be computed may be computed according to quartiles of scale score distribution.

APPENDICIES

The Pittsburgh Sleep Quality Index (PSQI)

Instructions: The following questions relate to your usual sleep habits during the past month only. Your answers should indicate the most accurate reply for the majority of days and nights in the past month. Please answer all questions.

1. During the past month, what time have you usually gone to bed at night?_____

2. During the past month, how long (in minutes) has it usually taken you to fall asleep each night?_____

3. During the past month, what time have you usually gotten up in the morning? _____

4. During the past month, how many hours of actual sleep did you get at night? (This may be different than the number of hours you spent in bed.) _____

For each of the remaining questions, check the one best response. Please answer all questions.

5. During the past month, how often have you had trouble sleeping because you ...	Not during the past month	Less than once per week	Once or twice per week	Three or more times per week
a) Cannot get to sleep within 30 minutes				
b) Wake up in the middle of the night or early morning				
c) Have to get up to use the bathroom				
d) Cannot breathe comfortably				
e) Cough or snore loudly				
f) Feel too cold				
g) Feel too hot				
h) Had bad dreams				
i) Have pain				
j) Other reason(s), please describe				
6. During the past month , how often have you taken medicine to help you sleep (prescribed or "over the counter")?				
7. During the past month, how often have you had trouble staying awake while driving, eating meals, or engaging in social activity?				
8. During the past month, how much of a problem has it been for you to keep up enough enthusiasm to get things done?				
	Very good (0)	Fairly good (1)	Fairly bad (2)	Very bad (3)
9. During the past month, how would you rate your sleep quality overall?				

APPENDICIES

Component 1	#9 Score	C1 _____
Component 2	#2 Score (≤15 min=0; 16–30 min=1; 31–60 min=2; >60 min=3) + #5a score (if sum is equal 0=0; 1–2=1; 3–4=2; 5–6=3)	C2 _____
Component 3	#4 Score (>7=0; 6–7=1; 5–6=2; <5=3)	C3 _____
Component 4	(total # hours asleep) / (total # of hours in bed) x 100 >85%=0; 75–84%=1; 65–64%=2; <65%=3	C4 _____
Component 5	Sum of Scores #5b to #5j (0=0; 1–9=1; 10–18=2; 19–27=3)	C5 _____
Component 6	#6 Score	C6 _____
Component 7	#7 Score + #8 Score (0=0; 1–2=1; 3–4=2; 5–6=3).....................................	C7 _____

Add the seven components together   **Total PSQI score_____**

Reprinted with permission from Daniel J. Buysse.

Buysse, D. J., Reynolds III, C. F., Monk, T. H. Beriman, S. R. & Kupfer, D. J. (1989). The Pittsburgh Sleep Quality Index: a new instrument for psychiatric practice and research. *Journal of Psychiatric Research*, *28*, 193–213.

APPENDICIES

Epworth Sleepiness Scale

Name: _____ Date: _____

Age: _____ Sex: Male _____   Female _____

How likely are you to doze off or fall asleep in the following situations, in contrast to feeling just tired? This refers to your usual way of life in recent times. Even if you have not done some of these things recently try to work out how they would have affected you. Use the following scale to choose the most appropriate number for each situation:

Scoring:

0 = no chance of dozing
1 = slight chance of dozing
2 = moderate chance of dozing
3 = high chance of dozing

Situation	Chance of dozing
■ Sitting and reading	
■ Watching television	
■ Sitting inactive in a public place (e.g. a theatre or a meeting)	
■ As a passenger in a car for an hour without a break	
■ Lying down to rest in the afternoon when circumstances permit	
■ Sitting and talking to someone	
■ Sitting quietly after a lunch without alcohol	
■ In a car, while stopped for a few minutes in traffic	
Total	

Score:

0–10   Normal range
10–12   Abnormal range
12–24   Abnormal

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APPENDICIES

Recognizing Fatigue Checklist

Question	Yes	No
1. Have verbal comments about feeling tired and being fatigued increased?		
2. Are there more complaints about physical ailments?		
3. Are staff members unusually irritable?		
4. Are disagreements among staff becoming more acrimonious and occurring more often?		
5. Are staff members having difficulty concentrating?		
6. Are staff members complaining about lack of adequate sleep and rest?		
7. Do staff members appear more tired than usual? Are they listless? Do they have dark circles under their eyes?		
8. Are staff members unable to complete their assignments in a timely, efficient manner?		
9. Have work-related injuries increased?		
10. Has the use of sick days increased?		
11. Are staff members becoming accident-prone?		
12. Are staff members having difficulty concentrating?		
13. Are staff members unusually emotionally labile?		
14. Is there a lack of interest in projects and activities that usually interest staff members?		
15. Are staff members expressing concern about their interpersonal relationships?		

Analysis of Fatigue

1. Are there evident signs and symptoms of fatigue?　　　　　　　　Yes _____ No _____

2. Which staff members are most affected by fatigue?　　　　　　　　Yes _____ No _____

3. Is there a pattern to staff members' experience of fatigue?

　　a. What shift(s) do these staff members work?　_____

　　b. How often do they rotate shifts? _____

　　c. What is the length of each shift? (e.g., eight hours, 12 hours, etc.) _____

　　d. How often do these staff members work overtime? _____

　　e. Is there a predominant age group that exhibits fatigue?　　　　　　Yes _____ No _____

　　(If yes, describe) _____

　　_____

　　f. Is there an increase in the number of adverse occurrences involving these staff members?

　　　　　　Yes _____ No _____

　　(If yes, describe) _____

　　_____

Reprinted with permission from: Adrianne A. & Aquirre, A. (2005). *Fight fatigue: A nurse manager's guide to reduce risk and revitalize staff*. HCPro Inc.: Marblehead, MA.

Analyzing Fatigue Worksheet

1. What types of adverse events occurred?

_____

_____

2. When did the events occur? Is there a pattern to their occurrence?

_____

_____

3. Describe the work patterns of the staff members involved in these events:

    a. During what shift did the events take place?

    _____

    b. At what point in the shift did the events take place? (e.g. end of shift, beginning of shift, etc.)

    _____

    c. How many days (evenings or nights) in a row did the staff members work before becoming involved in the adverse events?

    _____

    d. Were any of the staff members involved working overtime at the time of the adverse event? If so, how many periods of overtime had they worked in a seven-day period?

    _____

    e. What was the direction of shift rotation (forward or backward) for persons involved in the events?

    _____

    f. What was the scheduled length of shift (e.g. eight hours, 12 hours, etc.) for persons involved in the events?

    _____

    g. How often were the staff members involved in the events required to rotate to various shifts?

    _____

APPENDICIES

Healthy Work Environments
Best Practice Guidelines

Preventing and Mitigating
Nursing Fatigue in Health Care

Ontario

Healthy Work Environments
Best Practice Guidelines

Preventing and Mitigating Nursing Fatigue in Health Care

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