

# Fitness for Duty Includes Getting Your ZZZZs



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## Introduction

In 2006, Wisconsin registered nurse Julie Thao faced criminal prosecution for “neglect of a patient causing great bodily harm” following a medication error that resulted in a patient’s death. Nurse Thao had slept at the hospital the night before after a 16-hour shift. It was the July 4<sup>th</sup> holiday, and she had agreed to work a double shift (7:00 a.m. to midnight) in order to help provide adequate staff coverage for the Labor and Delivery unit in which she was employed. Nurse Thao mistakenly infused an epidural anesthetic intravenously, thinking the drug was an antibiotic prescribed for a strep infection the patient had. Both infusion bags had been placed next to each other on a counter in the patient’s room. The

patient died within the hour, although her newborn son survived (Error, 2006).

Was nurse Thao guilty as charged? Or was nurse Thao, who had an impeccable record prior to this incident, a good nurse who made a mistake with disastrous consequences? Most nurses will make medication errors at some point in their careers, and most of their patients will be “lucky” enough not to suffer serious consequences from their mistakes. How does the fact that nurse Thao had worked a double shift the day before and slept at the hospital play into the error equation?

Nurses are frequently asked to “work over” to cover an unexpected absence of a co-worker or to cover a chronically short-staffed area. Despite the availability of extra hours and the temptation of additional income, the professional accountability of nursing carries a responsibility to be in a safe condition to care for patients. “Fitness for duty” is used to describe this condition. Nurses may not be aware of what factors influence fitness for duty and how easily human performance limitations- emotional, cognitive, and physical components- can contribute to errors. This article reviews the limitations of human performance as it influences fitness for duty and impacts the nurse’s ability to practice safely.

## Anatomy of an Error

Anatomy is the science of structure. We all completed an anatomy course early in our nursing education to learn about the structure of the human body, but most of us have probably not considered the anatomy of an error until we are faced with the consequences of an error. It is at that point that we can ask, “How did this happen? I was so careful!” The obvious answer is that we are human and ‘to err is human.’ But, there is more....

Error is defined as those occasions when a planned activity fails to achieve the intended outcome. (Reason, 1990). Errors can be broken down into two types. Active errors occur by the person doing the activity, for example when a nurse gives the patient a wrong medication. Latent errors occur farther away from the action, that is, away from the bedside. An example might be look-alike medications stored in adjacent bins in the medication cart or new equipment to which staff have not been oriented. Essentially, these are errors waiting to happen.

Because human error is inevitable, prevention is directed at the design of systems that can prevent errors – mechanisms that don’t allow you to make a mistake. “We cannot change the human condition, but we can change the conditions under which humans work.” (James Reason). For instance, you cannot fill your car’s unleaded gas tank with leaded gasoline because the gas receptacle for no-lead gasoline tanks has been designed smaller than a leaded nozzle. The two don’t fit, thus preventing an error.

There are many examples of this approach in health care as well: pre-filled syringes prevent dosage errors, programmed infusion pumps prevent certain infusion errors, and bar coding has prevented some identification errors. However, health care is extremely complex and it is impossible to design potential errors out of all processes. Consider the design of the work environment, staffing and scheduling practices, and communication processes – has any health care system perfected these designs to eliminate error? Though improvements have been made, nurses continue to be left at the “sharp end” where latent errors become active. Therefore, the nurse often represents the final opportunity to prevent a *latent error*



from becoming an *active error* – the last safety net so to speak.

### Human Performance Factors

Humans are imperfect. Human factors confound performance and risk for errors. Some human factors affecting performance include distraction, fatigue, pressure/stress, norms, lack of communication, lack of knowledge/skills, lack of teamwork, and lack of resources. Many of these factors involve our interaction with the environment, for example, when we're faced with unfamiliar equipment, poor lighting in a patient's room, a noisy nurses' station, or a difficult physician. Environmental distractions are a well documented factor in medical errors. When reduced, performance improves. Recently, several San Francisco hospitals were successful in reducing their medication errors by 88 percent by reducing the interruptions (distractions) nurses experienced when administering medications (*San Francisco Chronicle*, 10/28/09).

Other human factors are internal. Fatigue is an internal human factor that crosses both our emotional state and physical abilities. Performance ability considers the relationship of the nurse's work capacity to workplace demands and can be referred to as "fitness for duty." We often think of impaired practice due to alcohol or other substance use when we hear the term "fitness for duty," but fitness for duty is actually a broader concept that encompasses any factor that may affect the nurse's ability to perform competently and safely. Fatigue is one such factor that has been studied thoroughly in other industries, but only recently applied to healthcare.

### Fatigue as a Factor in Fitness for Duty

Any factors affecting the nurse's ability to perform competently and safely influence the nurse's fitness for duty. Fatigue is defined as "an overwhelming sense of tiredness, lack of energy, and a feeling of exhaustion associated with impaired physical and/or cognitive

functioning, sleepiness, and fatigue often co-exist as a consequence of sleep deprivation." (Rogers, 2008, p.2-509). Fatigue may result from circadian rhythm effects, sleep deprivation and continuous fatigue effects, and "time-on-task" effects.

Our sleep-wake cycle is regulated biologically by two factors and their interactions: a homeostatic system and circadian rhythm. Circadian rhythm is a "biological clock" which regulates our periods of sleepiness and wakefulness during the day. It functions in response to light signals which stimulate the release of hormones such as cortisol in the morning light and melatonin in evening. We respond with fluctuations in attentiveness during the day. Most of us experience our greatest sleepiness in the early morning hours (2:00 a.m. – 4:00 a.m.) and a lesser period in the early afternoon (1:00 p.m. – 3:00 p.m.). Circadian rhythms can only be shifted one to two hours in either direction and can be influenced by our sleeping and waking behaviors. For example, if we normally wake early in the morning, but stay up late and sleep over on the weekends, we experience greater than usual sleepiness on Monday morning as our body adjusts to the change in sleep pattern. Disturbances in circadian rhythm, such as when traveling across time zones, also interrupt our normal sleep patterns and force our body to adjust – we experience this as "jet lag." Night shift workers are especially challenged to manage disruptions to circadian rhythms.

Sleep deprivation may result in:

- Lapses in attention and inability to stay focused
- Reduced motivation
- Compromised problem-solving
- Confusion or bewilderment
- Irritability or hostility
- Unusual tenseness or anxiety
- Memory lapses (particularly in short term memory)
- Impaired communication
- Faulty information processing and judgment
- Diminished ability to detect and

recognize the significance of subtle changes in patient's health

- Diminished reaction time
- Slowed information processing
- Inability to deal with unexpected indifference and loss of empathy

Sleep/wake homeostasis is a second biological component that interacts with our circadian rhythm to help us maintain adequate sleep. While circadian rhythm regulates the timing of sleepiness, sleep-wake homeostasis is concerned with the duration and intensity of sleep. While awake, we accumulate a need for sleep. When we get adequate quality sleep, we are able to replenish this sleep deficit. When we don't, our homeostasis or balance is upset and we become sleep deprived.

Most adults require seven to eight hours of sleep per day. Sleep deprivation occurs when we don't get required sleep or when we are awake longer than 16 hours. Lack of uninterrupted sleep intervals, such as when breaking up sleep into several naps, can also contribute to sleep deprivation (as any mother of an infant can attest!). A sleep deficit is cumulative over time and may require more than one replenishing normal sleep cycle to remedy.

Time-on-task is an industrial concept that refers to fatigue that accumulates during the work period. Prolonged concentration while reviewing and noting physician orders may be an example of time-on-task that may result in fatigue. Generally, fatigue increases and performance diminishes with sustained task effort.

### How Fatigue Affects Fitness for Duty

Imagine...you are on your way to Hawaii to begin your dream vacation. As you board your airplane you are greeted by a red-eyed pilot carrying a large "energy drink" and overhear her comments to the flight attendant that she only had time for a four-hour nap between flights so was feeling a bit tired. Sound frightening? Would you board the plane?

What if you knew that in a safety

study conducted by the National Transportation Safety Board (NTSB) of U.S. major carrier accidents from 1978 to 1990, it was concluded:

*Half the captains for whom data were available had been awake for more than 12 hours prior to their accidents. Half of the first officers had been awake for more than 11 hours. Crews comprising captains and first officers whose time since awake was above the other made more errors overall and significantly more procedural and tactical decision errors (1994).*

How confident are you of the pilot's fitness for duty?

Insufficient sleep is associated with cognitive problems, mood alteration, reduced job performance, reduced motivation, increased safety risks, and psychological changes (Rogers, 2008). Federal regulators recognize the adverse effects of fatigue on safety and require the airline industry (along with trucking and nuclear industries) to directly manage fitness for duty of airline crew members – specifically the number of consecutive hours that can be worked and the number of hours required between work periods for adequate rest. In 2004, the Institute of Medicine (IOM) report recommended Regulatory Boards should prohibit nursing staff from providing patient care in any combination of scheduled shifts, mandatory overtime or voluntary overtime in excess of 12 hours in any given 24 hour period and in excess of 60 hours per 7-day period.

Patients in hospital beds are more likely to be greeted by a sleepy nurse than airline passengers are a sleepy pilot. Knowing that this sleepy nurse has a significantly greater risk of making an error that will affect your care, and perhaps your recovery, how safe do you feel now?

Despite recommendations from the Institute of Medicine in 2004, (*To reduce error-producing fatigue, state regulatory bodies should prohibit nursing staff from providing patient care in a combination of scheduled shifts, mandatory overtime, or voluntary overtime in excess of 12 hours in any given 24-hour period and in excess of 60 hours per 7-day period*), and recent attention to hours worked by

medical residents, hours worked by nurses remain, for the most part, unchallenged. In a survey conducted by the Texas Nurses Association, 60 percent of hospital chief nursing officers reported having a fitness for duty policy, yet only 4 percent of those reported considering fatigue as a component of this policy.

Nurses are not immune to fatigue or related effects on performance. A landmark study of 393 staff nurses over 5317 work shifts documented the significant effects of work duration, overtime, and number of hours worked on errors:

- *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.*
- *Working overtime increased the odds of making at least one error, regardless of how long the shift was originally scheduled.*
- *There (was) a trend for increasing risks when nurses work overtime after longer shifts, with the risks being significantly elevated for overtime following a 12-hour shift.*
- *Working more than 40 hours per week and more than fifty hours per week significantly increased the risk of making an error.*
- *Results were somewhat similar for near errors (Rogers et al., 2004, p.207).*

### **Why are nurses at risk for fatigue?**

There are a number of professional and personal factors that contribute to nurse fatigue. The unpredictable nature of the health care environment – emergencies, fluctuating census patterns, changes in patient conditions, physician practice patterns-contributes to changing needs for nursing staff. Although organizations have strategies for anticipating patient care needs and scheduling staff appropriately to meet those needs, it is often a “best guess” and must be adjusted. This creates gaps in staffing needs – some days more nurses than those scheduled will be needed, requiring additional work hours and possible overtime. An organization that has vacancies faces even greater challenges

in meeting its staffing needs without requiring additional hours from nurses.

### **Professional Factors Related to Nurse Fatigue:**

- On-call hour
- Required overtime hours
- Total # hours worked per week
- Length and sequencing of shifts
- Rotating shifts
- Chronic short staffing
- Working when sick

### **Personal Factors Related to Nurse Fatigue:**

- Working extra jobs
  - Voluntary overtime
  - Additional home/family responsibilities
  - Overall physical/mental health
- (Nursing Organizations Alliance, 2006)

Characteristics of a 24-hour, 7 day-a-week operation also contribute to a nurse's risk for fatigue. Night shift hours predispose individuals to sleep deprivation due to their circadian rhythm and likely interruption in sleeping schedule on days off. Twelve-hour shifts are popular with nurses, but they easily lead to fatigue at the end of the work day, or at the completion of a few shifts in a row. On-call often interrupts sleep as well as requires nurses to work hours exceeding the recommended daily limit.

As human beings, nurses will have personal factors affecting risk for fatigue. Nurses who report social duties and caretaking roles outside of work often report higher levels of stress both at work and at home. A nurse may be the caretaker for elderly family, young children, or ill partners. Concerns about one setting (e.g., the home) are frequently reported to interfere with performance in the second arena (work) (Scott et al., 2006) Our physical and mental health – aging, dehydration, depression, anxiety and stress – also affects our experience of fatigue and related performance.

### **Nurse's responsibility for fitness for duty**

Just as you wouldn't go in to work under the influence of alcohol, you shouldn't go to work under the influence of fatigue – whatever the reason (personal or professional factors). Vigilance is not enough. Individuals are poor



Sleep Hygiene	
Do	Don't
Establish a regular schedule: wake up & go to bed at the same time every day	Go to bed if you aren't sleepy
Practice a relaxing bedtime routine	Consume alcohol, caffeine, heavy/spicy/sugary food 4-6 hours before bed
Create a sleep friendly environment	Go to bed hungry
Exercise! But not right before bed	Read, write, eat, watch TV, etc in bed

judges of their impairment from fatigue or sleep deprivation and alertness cannot be willed.

The nurse has a primary duty to his/her patient(s) that supersedes any facility policy or physician order. The Code of Ethics for Nurses (ANA, 2001) clearly outlines the nurses' responsibility for safe patient care:

- "The nurse's primary commitment to the patient ..." (Provision 2)
- "The nurse is responsible and accountable for individual nursing practice..." (Provision 4)

Further, in the North Carolina Board of Nursing statement on "Extended Work Hours and Patient Safety" ([www.ncbon.com-Practice-Position-Statements-Extended-Work-Hours-and-Patient-Safety](http://www.ncbon.com-Practice-Position-Statements-Extended-Work-Hours-and-Patient-Safety)) nurses and managers are encouraged to avoid overtime hours if either has reason to believe that the licensee is sleep deprived or performance is otherwise compromised. Nurse must communicate safety concerns clearly to managers and those working in more than one job must exercise caution in self-regulating their total hours worked. It is the position of the Board of Nursing and Division of Health Service Regulation that work hours must be managed by all concerned with an emphasis on safe patient care.

The nurse has a duty to always act in the best interest of the patient. This duty to the patient includes being physically and emotionally "fit" to provide safe patient care. Therefore, nurses providing direct patient care have a professional responsibility to ensure they are adequately rested and not fatigued when accepting a patient assignment.

Likewise, a nurse making an assignment for staffing a unit must consider the physical and emotional ability of the person to whom the assignment is made and is therefore responsible for considering the nurse's fatigue and patient's safety in making an assignment, a work schedule, or setting policies (e.g. on-call hours).

### Individual Safety Practices

Despite the evidence, nurses are frequently faced with either voluntary or required work schedules that may put them at risk for fatigue. How can nurses protect themselves and their patients when they may be at risk for fatigue? A number of countermeasures, preventative and operational strategies (Rosekind et al., 1996), can assist in maintaining alertness and on-the-job performance. However, these strategies should be applied with caution—they do not eliminate the safety risks of working when fatigued.

### Evidence-Based Practice Recommendations

- Get 7-8 hours of sleep per 24 hour period
- Do not work > 48 hours in a 7-day period
- Do not schedule/work 12-hour shifts
- If you must work 12-hour shifts:
- Do not work more than 3 shifts without a day off
- Take breaks free from patient care responsibilities (10 minutes/2hours and a 30 minute meal break)
- Take 10-12 hours off between shifts to obtain adequate sleep
- Use caffeine therapeutically

- Do not consume caffeine outside of work hours
- Only consume caffeine at the beginning of the shift or between 3:00 a.m. and 5:00 a.m.
- If you work nights, take a nap prior to your shift  
Rogers, 2008

A primary preventative countermeasure is to minimize sleep loss by using days off to "catch up" or "stock up" in anticipation of sleep debt. Good sleep habits, or sleep hygiene can improve sleep quality. However, despite the quality of sleep, several sleep cycles are required to fully recover from a sleep deficit and sleep cannot be effectively "stored" to accommodate for a future lack of sleep.

Operational strategies include those things you can do while on the job to mitigate fatigue. Social interaction and conversation can assist in maintaining alertness, physical exercise combats sleepiness, however may leave one more fatigued later. Strategic use of caffeine can improve alertness. Nutritional snacks and planned breaks can assist the nurse in maintaining energy.

The nurse has a primary duty to the patient. Nurses who believe that this duty may be violated by accepting an assignment when too tired to work safely must refuse the assignment. The decision to refuse the assignment must be based upon the belief that no reasonable nurse would accept the assignment.

### Organizational Safety Practices

Health care has traditionally valued nurses who never call in, who pick up extra shifts when needed, and who never seem to need a break- yet, this valuing allows fatigue and its dangers to permeate the organizational culture. Current evidence and recommendations challenge organizations to shift their culture toward one respectful of the deleterious effect of fatigue on the patients, the nurse, and the organization. A number of organizational practices can be implemented to fight fatigue in the workplace. First, organizations can work to understand current practices that may contribute to fatigue by conducting an assessment of staffing

continued on page 20 >>>



and scheduling, use of overtime and breaks, nurse satisfaction measures, and patient incident and employee accident reports. This information can help organizations in identifying their risks related to potential fatigue, prioritizing issues, and developing a fatigue management plan to incorporate evidence-based recommendations.

**When duty to keep patients safe is threatened by fatigue.....**

Jennie began her day of scheduled on-call at 3:30 p.m. when her 8-hour OR shift concluded. After arriving home at 4:30 p.m., she had something to eat and then took a 2-hour nap. At 10:30 p.m. she was called in for a trauma. She completed two emergency cases that night and was particularly disturbed by one patient, a young woman who died during surgery.

She returned home at 4:30 a.m., but had a difficulty falling asleep. Feeling exhausted, she called the charge nurse at 5:00 a.m. to let her know that she felt too tired to work after taking call that night. The charge nurse told her she was expected to come in to work and coming in on-call was no excuse for missing work. Despite grabbing a double Espresso on the way to work, Jennie found herself having difficulty staying awake while driving.

What should Jennie do? What responsibility does her Manager have in this situation?

Jennie is accountable for knowing if she is safe and competent to accept an assignment (21 NCAC 36.0217 (c) (7) –accepting or performing professional responsibilities which the licensee knows or has reason to know he or she is not competent to perform. Therefore, in this situation Jennie must refuse to accept an assignment.)

The Charge Nurse, likewise is accountable for her decision to make an assignment to Jennie, (21 NCAC 36.0217 (c) (5)-delegating responsibilities to a person when the licensee delegating knows or has reason to know that the competency of that person is impaired by physical or psychological ailments, or by alcohol or other pharmacological agents, prescribed or not.) Therefore, in this situation the CN should not give Jennie an assignment.

**Conclusions**

The fallibility of human beings, limitations of human performance, and importance of fitness for duty are well established. The health care industry has not yet incorporated this knowledge into its systems to effectively design out errors or “mistake proof” care. It is incumbent on the nurse to assume responsibility for safe patient care. That responsibility includes ensuring personal fitness for duty when accepting an assignment.

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