The act of praying is a deeply personal, yet profoundly universal, experience. It is an aspiration of the heart. A prayer can range from a daily expression of gratefulness, to a plea for help or confession of sins, to a simple conversation to a sacred, higher source. Praying fulfills the desire for a spiritual connection between humanity and its divine creator (Merton, 1969). The act of praying offers insight into the mystery of life, its purpose and meaning, and the opportunity to acknowledge something larger than oneself. Throughout human history, encounters of prayer have been described as bringing peace to chaos, direction to confusion, confidence to fear, and comfort to pain. Praying is a personal spiritual behavior, central to a close relationship with God/LifeForce/Absolute/Transcendent. Around the world, this universal spiritual practice provides comfort and peace to one who prays and for those for whom prayers are said.

According to the Pew Research Center (2015), more than half (55%) of Americans say they pray every day, with 21% reporting praying weekly or monthly. Even among those who are religiously unaffiliated, 20% say they pray daily. Women (64%) are more likely than men (46%) to pray every day. Adults aged 65 and older (65%) report praying daily more often than adults under age 30 (41%). Cultures worldwide recognize the power of prayer (Mosley & Hill, 2000). Prayer appears universally in all faiths, yet prayer is not dependent on a prescribed religion for participation (Meisenhelder & Chandler, 2000). In both monotheistic and polytheistic traditions, praying is a universal expression of an innate human desire to share an intimate dialogue with the divine.

It may be spiritual connectedness that makes the experience of prayer unique for each individual. During the act of praying, the soul or inner essence of the person is connected to a higher degree of consciousness and a power that transcends and expands human possibilities. This idea is aligned closely with Watson’s (2005) transpersonal caring-healing model, that the human experience of praying is intrinsically related to the co-evolving human in the universe and to a sense of sacred engagement with regard to self, others, nature, and the universe. The caring field is described as a quantum concept of waves radiating from each person and becoming part of a new field of possibility, all within a caring moment, affected by one’s consciousness and intentionality (Watson, 2005). Intentionality is defined as a mental direction or projection of awareness toward an object or outcome (Dossey, 1996; Schlitz, 1995). Consciousness may directly or indirectly affect individual and collective well-being. The concept of conscious intentionality paves the way to the use of belief systems and spiritual practices such as visualization, imagery, prayer, and meditation – all of which enhance healing and wholeness at the spiritual level of consciousness.

Holistic caring recognizes the spiritual practices that patients and their families find meaningful as resources for illness prevention, coping, and recovery (O’Hara, 2002). Spiritual care is valued as an essential nursing intervention (Lewis, 1996; Malinski, 2002). Research has shown that praying contributes to health, well-being, and quality of life (Costello, 2017; Dossey, 1996; Koenig, McCullough, & Larson, 2001) together with feelings of spiritual belonging and interconnectedness that ultimately lead to a sense of peacefulness and wholeness.

Nurses who respect the personal nature of praying are in the best position to hold sacred space for patients as they can reach out to and listen for divine strength and comfort. The only way nurses can be
authentically in right relation with the spiritual needs of another is to be intimately aware of their own spiritual maturity. Self-reflection, a core value of holistic nursing, promotes a deeper awareness about what is important and meaningful in life (AHNA & ANA, 2013). Nurses often cope simultaneously with personal challenges while holding space for the vulnerabilities and fears of others. Prayer may offer the nurse an intimate level of self-discovery, along with new power for human connection and compassion.

So how do you know when your patient (student, colleague, etc.) needs to pray? According to Watson (2005), transpersonal caring begins with authentic presence, a spirit-to-spirit connection which allows the patient to share subjective insights and the meaning of experiences. A caring-healing relationship honors inner wisdom and unites each person with a deeper level of human understanding. As the need for spiritual care emerges, prayer and the opportunity for holding sacred space can take many forms. You might sense a need for calm, for clarity, and a slow, deep breath. You can help relieve anxiety by interrupting negative self-talk and call for a moment of silent reflection, meditation, or mindfulness. A “breath prayer” can be suggested; repeating two or three words while inhaling and two or three words while exhaling, such as “give me courage so I can rest” or “your love gives me peace.”

Ask the person if they would like to pray. If you feel comfortable praying out loud, ask if you can say a prayer for them or with them. Regardless of their faith tradition, I have had people respond, “Well, I don’t pray very often myself, but I sure couldn’t hurt.” If this is not your comfort zone, ask the person if they would like to say a prayer. You might repeat a prayer together (the Lord’s Prayer, for example, if you are both Christians), or you could both silently pray together. If the person prefers to pray alone, provide a clean, quiet environment with few distractions or interruptions. The nurse may also offer to contact a chaplain or a personal spiritual leader. Become familiar and comfortable with the prayers of different religious traditions. I have closed my eyes and prayed with persons of many different faiths, speaking languages I couldn’t understand, but still felt a deep reverence and humble connection with humanity and the sacred.

Nursing is committed to a covenantal ethic of human service and respect for the sacredness of life. Nightingale believed that praying was a “process of linking the outward personal self with the inward divine spirit” (Macrae, 2001, p. 93). Nightingale (1860/1994) wrote, “if we are to have no prayer, we lose our chief support and comfort in this painful world” (p. 126). The scope and practice of holistic nursing discusses “assisting individuals to find meaning in their health experiences….addressing the human spirit as a major force in healing” (AHNA & ANA, 2013, p. 16). Holistic nurses promote healing, wholeness, and connection through the spiritual practice of praying.

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Sleep & Immune Function:
Nurse Self-Care & Teaching Sleep Hygiene

By DEBRA ROSE WILSON, PhD, MSN, RN, IBCLC, AHN-BC, CHT & EMMA J. BROOKS, MS
Sleep is essential to the healthy functioning of the complex physiological system known as the human body. Dating back to before Hippocrates, rest was known to have a role in health and healing. A good night's sleep gives us a sense of being recharged. Sleep is not only restorative, it has a role in the regulation of the immune response (Brown, Basheer, McKenna, Strecker, & McCarley, 2012). Humans have always slept, and yet, sleep still continues to be a mysterious and poorly understood process (Ibarra-Coronado et al., 2015). There is something more than a little peculiar about tuning out and entering a vulnerable state for seven hours. But we all know that functioning while tired is not the best way to do any job.

Some interesting research in the last decade has explored the connections between sleep and immune function. With this information at hand, a nurse can improve self-care and appreciate the importance of teaching sleep hygiene as part of holistic health care.

**Brain Function in the Sleep-Wake Cycle**

Within the brain, the critical pathways associated with the sleep-wake cycle are the anterior hypothalamus (wake cycle) and posterior hypothalamus (sleep cycle). Other relevant players are the cerebral cortex, thalamus, pineal gland, and brain stem. The suprachiasmatic nucleus (SCN) in the hypothalamus controls the sleep-wake cycle and immunity connections.

The SCN is regulated by light and dark cycle cues received from the environment by the retina (Curtis, Bellet, Sassone-Corsi, & O’Neill, 2014). The SCN also gets cues from peripheral clocks (e.g., organs, tissues, cells). These are synchronized when neural and antibody information from the SCN passes through the efferent neurons to other brain regions. The communication pathways affect thermoregulation, hormone secretion, sleep-wake cycles, and the immune system’s circadian clock, as well as food intake behavior (Besedovsky & del Rey, 2011; Nader, Chrousos, & Kino, 2010).

**Sleep-Wake Cycle**

The sleep-wake cycle is key to physiological health, mental well-being, and an adaptive immune response (Besedovsky, Lange, & Born, 2012; Karatsoreos, Bhagat, Bloss, Morrison, & McEwen, 2011). Based on the 24-hour circadian clock regulated by the SCN, the sleep-wake cycle is a multi-oscillatory system that maintains the rhythm of physical and mental activity as well as complex bodily functions (e.g., cardiovascular system, cytokine production). It maintains this rhythm by cues picked up in body core temperature, light receptive cells, and the amount of activity of the body.

When we look at the sleep-wake cycle on EEG, there are three states of consciousness: wakefulness, non-rapid eye movement (NREM) sleep, and rapid eye movement (REM) sleep.

The release of the essential neuropeptide, orexin (hypocretin), initiates the wakeful state. Other neurotransmitters, such as serotonin, catecholamines, neuropeptide S, gamma-aminobutyric acid (GABA), histamine, and acetylcholine (ACh), are also involved in the activation of the wakefulness cycle, and all this is regulated by the hypothalamus and brain stem (Brown et al., 2012).

The sleep state is activated when the SCN detects darkness and passes the information to the hypothalamus, which signals the production of melatonin by the pineal gland. It is the absence of light that is key to maintaining the circadian rhythm, where melatonin production peaks between 2 a.m. and 4 a.m. Light (even artificial) during the dark phase can negatively affect interactions between systems, causing neural, immune, and endocrine interactions to suffer (Dauchy et al., 2010). There are numerous studies examining the effect of 24-hour bright light on ICU patients as well as the effects of night shift on health. To optimize immune function, the take home message here is sleep in a dark room.

**Immune Function, Inflammation & Sleep-Wake Cycles**

Life is a system of rhythms: seasons, day and night, and sleep-wake cycles. The sleep-wake cycle plays a critical role in balancing the body’s immune function. As you progress into sleep, the stress systems (sympathetic and HCA) reduce function. When no longer suppressed by the hormones of stress, the immune system begins maintenance and repair functions (Besedovsky, Lange, & Born, 2012). Deep sleep reduces inflammatory factors, and lack of sleep impairs the balance of natural killer (NK) cells. Immune memory is built during deep stages of sleep so future encounters with a pathogen will be dealt with swiftly.

Inflammatory processes protect the body from injury and disease, and involve mobilizing immune cells (white blood cells) to attack foreign pathogens and heal damaged tissue. There are two main sub-types of immune cells: T cells and macrophages. Cell signaling proteins called cytokines aid in regulating the body’s immune response and stimulate immune cells towards areas of trauma, infection, or inflammation. T cells and macrophages are major producers of cytokines, such as interleukins (IL-1, IL-2, etc.).

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Cytokines can be pro-inflammatory or anti-inflammatory. Pro-inflammatory cytokines act as messengers to increase the body’s inflammation in response to an injury or infection. People with chronic inflammatory diseases and depression have higher levels of circulating pro-inflammatory cytokines (Gómez-González et al., 2012; Wilson & Warise, 2008). The cytokines IL-1 and tumor necrosis factor alpha (TNF-α) kick in with sleep and promote the deep sleep that happens before rapid eye movement and dreaming. The link between lack of sleep and increased inflammation becomes clear in research, and sleep disturbances lead to increases in disease and death. This effect is more profound for those who already have an inflammatory disease and those who are aging.

While the body is awake, the immune system is protecting the body against foreign pathogens. Anti-inflammatory cytokines (IL-4, IL-10, IL-13, and TGF-β) are active (Gómez-González et al., 2012).

Natural killer (NK) cells, immune cells whose job is to stop the growth of mutating cells such as cancer, increase production during the wakeful state. However, NK cells are affected by stress and production becomes unbalanced when the sympathetic nervous system spills the stress hormones. The longer you are stressed during wakeful periods, the less opportunity NK cells have to balance production and function, and hence, the greater the chance that rogue cells will continue to mutate.

During stress, the hypothalamus pituitary adrenal (HPA) axis is busy suppressing pro-inflammatory cytokines (IL-1, IL-6, IL-2, IL-18, TNF-α), and balancing helper T cells (CD4+T) through cortisol release (Curtis et al., 2014). The body can’t do maintenance work on immune function when under stress and resources are being transferred to first aid and alarm response systems.

Once asleep, inhibitory neurons such as galanin, GABA, and adenosine (a neuromodulator) counteract the neurons released (e.g., orexin, catecholamines) in the wake-cycle process (Brown et al., 2012). The body is put back into balance as CD4+ T cells and responses to pathogens are highest during the sleep state (Cermakian et al., 2013).

The Sleep Cycle: NREM and REM
The sleep cycle consists of two phases: non-rapid eye movement (NREM) and rapid eye movement (REM) (Ganz, 2012; Gómez-González et al., 2012). NREM and REM in humans are repetitive, cycling about five to six times with each cycle lasting approximately 90 minutes. However, time spent in each period fluctuates throughout the night (Ganz, 2012).

NREM conserves energy, lowers body temperature, and aids in the restoration and regeneration processes of the central nervous and immune systems (Curtis et al., 2014).

There are four stages of NREM:
- Stage I (sleep onset) is the light stage of sleep with slower EEG frequencies.
- Stage II is an intermediate, arousable sleep.
- Slow-wave sleep or delta sleep is associated with the deep stages of sleep III and IV.
- Stage IV is the deep sleep with a delta wave (3-5 Hz).

During sleep stages I and II, a person is more easily awakened. As sleep progresses throughout the night, stages III and IV get longer, while the light sleep stages I and II get shorter. The immune system strengthens and repairs itself in deep (delta) sleep. In delta state, protein synthesis for the formation of immune memory takes place. Refer to Figure 1 for a review of cell-mediated immunity. The immune system will remember pathogens better if it has time to recover over a few nights. Then next time the body is exposed to a pathogen, the immune system knows exactly how to disable that infection. If the body does not have repeated delta states in the night and is sleep deprived, this may be where recognition of pathogens gets muddled. More importantly, poor sleep may lead to lessened ability to differentiate between invaders and self. When the immune system no longer recognizes self and attacks the body’s tissue as if it were an invader, an autoimmune disease is born (Sangle, Tench, & D’Cruz, 2015).

After NREM delta sleep, rapid eye movement (REM) is the final phase of the sleep cycle. REM sleep is the dream state with brain wave activity similar to wakefulness (Ganz, 2012; Gómez-González et al., 2012). REM enables cognitive processing of emotions, learning and memory integration, as well as problem solving. Acute inflammatory states reduce time spent in REM (Huang, Alamili, Nielsen, Rosenberg, & Gögenur, 2015). Additionally, infections and stress affect the time spent in each cycle.

Sleep Deprivation
Both short-term and long-term sleep deprivation are related to disruptions in the 24-hour circadian clock and immunological functions. Sleep deprivation increases the risk for inflammatory
disease (Irwin, Olmstead, & Caroll, 2016), cardiovascular disease (Motivala, 2011), and breast cancer (Wang et al., 2015).

Chronic sleep disruption (e.g., on-call, shift work) affects cardiovascular autonomic response and immune modulation (Tobaldini et al., 2013) and deregulates cytokines, cortisol, and inflammatory markers (Wright et al., 2015). Sleep-wake disturbances found in shift workers also contribute to circadian disruptions as well, increasing the risk of breast cancer (Wang et al., 2015) and type 2 diabetes (Pan, Schernhammer, Sun, & Hu, 2011).

Changing the 24-hour clock affects thermoregulation, metabolism (e.g., plasma leptin and insulin levels), cognitive flexibility, and behavior (Karatsoreos et al., 2011), and a change in sleep patterns (Phillips, Savenkova, & Karatsoreos, 2015). Even short-term sleep disruptions, such as those that occur in sleep apnea, have been linked to coronary heart disease and increased risk of hypertension, type II diabetes, and metabolic syndrome (see box at right).

Recovery sleep seems to be ineffective. Stress and immune functions even after recovery sleep remained compromised (Faraut, Boudjeltia, Vanhamme, & Kerkhofs, 2012; Lungato et al., 2016). However, napping with some delta waves may inhibit cortisol release and positively affect neuro-immune-endocrine functions, making napping a possible remedy (Faraut, Bayon, & Léger, 2013). In a nutshell, you can't store sleep. The body's immune function does not recover from lack of sleep efficiently, and napping is back in vogue. Avoid napping for longer than 30 minutes though, as the circadian rhythm can get dysregulated.

**Glial Activity & Immune Function**

Chronic sleep deprivation is associated with inflammation, dementia, and reduced cognitive performance. Sleep loss has a ripple effect on inflammation and brain function. The immune system becomes overreactive and overresponds with inflammatory responses. Microglia are immune cells in the central nervous system that respond to challenges to the immune system. They are also a critical component of sleep regulation. Microglial cells clean up cell debris with phagocytosis. Astrocytes are also a type of glial cell that removes unnecessary synapses. These glial cells become overactive during chronic sleep loss.

Mice who were exposed to chronic sleep restriction showed increased and unbalanced immune response that increased breakdown of brain cell synapses through phagocytosis. Inflammatory factors were not part of this equation (Bellesi, et al., 2017). The body is destroying itself, and neurodegeneration like this is seen in aging and dementia.

**Stress Management & Sleep Hygiene**

If you are stressed, quality sleep is difficult to achieve. The sleep-wake cycle is disrupted when pro-inflammatory cytokines and stress hormones (e.g., cortisol, epinephrine, and norepinephrine) are released by the HPA axis (Nader et al., 2010). These releasing hormones reset or delay the peripheral immune clocks (e.g., NK cells), affecting behavior and adaptive immune response (Cermakian et al., 2013; Nader et al., 2010). Circadian rhythms are vital to the body's complex chemical physiology; disruptions occur with the introduction of stress, sleep deprivation, sleep disturbance, or infections (Cermakian et al., 2013; Ibarra-Coronado et al., 2015; Phillips et al., 2015). Stress management techniques improve immune function, reduce obesity, and improve quality of sleep. Plan your stress management with intention. Be active, be mindful, and eat whole foods that contribute to less inflammation.

Sleep hygiene includes various practices that prepare the body for sleep and promote healthy restorative sleep. Practicing good sleep hygiene starts by taking small steps and making simple modifications to your lifestyle and daily routine, such as waking up at the same time each day (see box on p. 22). The National Sleep Foundation (NSF; sleepfoundation.org) has a Sleepiness Test that examines sleep patterns over the past two weeks. There is the Epworth Sleepiness Scale that assesses daytime sleepiness and STOP-Bang screening questions for sleep apnea. If you aren't sure about your sleeping habits, try a sleep diary. The NSF can guide you through keeping a week sleep diary . The NSF can guide you through keeping a week sleep diary. 

Sleep apnea is a type of sleep disturbance during which an individual's breathing is interrupted or stopped during sleep. Sleep cycles are disturbed and shortened as the person wakes up briefly, restarts breathing, and gets oxygen levels up a little before dozing back off into sleep. There are two types of sleep apnea:

- **obstructive sleep apnea**, which increases with obesity and is caused by obstruction of the airway, and
- **central sleep apnea**, which occurs when the brain does not signal the muscles to breathe due to instability in the respiratory system.

Sleep apnea is a risk factor for coronary heart disease and is related to an increased risk of hypertension, type II diabetes, metabolic syndrome, and mortality. Evidence also suggests that obstructive sleep apnea is associated with elevated inflammatory markers such as CRP, IL-6, and TNF. Continuous positive airway pressure (CPAP) is the leading form of treatment for sleep apnea (National Sleep Foundation, 2017). The machine is worn during sleep to gently introduce air movement into the nasal and lung passages. The risk factors associated with sleep apnea diminish with CPAP (Hirotsu et al., 2017).
Shift work is part of our profession, but changes in sleep rhythms have a negative impact. Lack of sleep in nurses not only increases the chance of error (Johnson et al., 2014), but sleep deprivation also leads to health issues. This is a global issue for nurses. Nurses in military hospitals in China have poorer sleep quality and quantity when compared to other adults (Cui, Li, Wang, Chao, & Huang, 2017). In Iran, it was found that sleep quality for nurses was an important variable that mediated physical and mental health and quality of life (Zamanian, Nikeghbal, & Khajehnasiri, 2016). In Poland, nurses reported numerous symptoms of sleep deprivation including chronic fatigue (63.4%) and cardiovascular issues (40.6%) (Kulczycka, Szczuchniak, Stychno, & Kosicka, 2017).

Assessing our own sleep habits is an important part of our self-care as holistic nurses. The scope and standards of holistic nursing practice remind us that “Nurses cannot facilitate healing within others unless they are in the process of healing themselves” (AHNA & ANA, 2013, p. 21). By taking steps to get a good night’s sleep, reduce stress, and achieve harmony/balance in our own lives, we are serving as role models to our patients and colleagues.

Quality sleep in a dark environment is essential to immune functioning and health. What interventions are part of your plan to improve your quality of sleep?

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**10 Tips for Good Sleep Hygiene**

1. Avoid napping longer than 30 minutes.
2. Wake at the same time every day, even weekends.
3. Expose yourself to some sunshine and light every day.
4. Exercise in the first half of the day.
5. Avoid stimulants such as nicotine or caffeine within a couple hours of sleeping.
6. Keep your evening meal light and avoid foods that trigger heartburn. Foods heavy in fat, citrus, carbonation, or spices should be eaten for lunch.
7. Establish a relaxing bedtime routine such as a warm bath, meditation, exposure to aromatherapy, or reading a book.
8. Do not use lighted computer, TV, or phone screens for 90 minutes before bed. There shouldn’t be any flickering lights in the bedroom such as a television.
9. Keep your bedroom cool, darkened, and pet free.
10. Consider a white noise machine or a fan to reduce outside noise.


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