Reset Your Clock and Stay in Sync

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Today's society has created a culture that thrives on pressure and anxiety and produces a smorgasbord of stressors—many of which never really go away. Rapid changes in the economy, technology, healthcare, even the dramatic shifts in the weather are disruptive and invasive, often causing anxiety and distress. This month's column takes a look at how modern life can disrupt the biological rhythms that govern our health and well-being—and what we can do get back in sync.

Stress and Circadian Rhythms

The lives of virtually all plants and animals, from the simplest one-celled organisms to humans, are governed by a variety of internal biological rhythms. The human body follows the solar/lunar adaptations known as biological clock. The biological clock follows the main rhythm known as circadian rhythms. Research in chronobiology and neuroendocrinology suggests a relationship between stress and circadian patterns. The research examines the neural and behavioral features of circadian rhythms in humans and the mechanisms for remodeling and adjusting the body clock.1-3

Time is embedded in genes and the cells are able to tell the time, making it possible for an organism's physiological and biochemical functions to follow a rhythmic pattern synchronized with daily, monthly, or yearly changes in the environment. Many of the behavioral and physiological outputs of the circadian system are precise, quantifiable, and are known to be functionally important.1-3

Circadian rhythms are biological events that constantly repeat in a 24-hour period and are generated by an endogenous mechanism. This endogenous mechanism is composed of circadian clocks, including the central clock located in the suprachiasmatic nucleus (SCN) and other peripheral clocks defined as the intrinsic molecular mechanisms that allow the organism to adapt to changes in its environment. The clocks are synchronized or adjusted to coincide with periodical environmental events such as the day/night cycle. There are clear patterns of brain wave activity, hormone production, temperature regulation, cell regeneration, and other biological activities linked to this daily cycle.1-3

Studies have found that the internal clock consists of an array of genes and the protein products which they encode, that regulate various physiological processes throughout the body. When working properly, our bodies respond to nature's cues to create their ideal rhythms. If the circadian rhythms malfunction, it can greatly affect our health and well-being.1-3

Getting out of Sync

We live in a world obsessed with noise, speed, and activity. We often miss critical cues from the sun and moon, and our body clocks suffer. Without adequate light each morning, we fail to produce the hormones we need to start the day feeling active. When we miss out on daytime light, we become less productive and lethargic. At night, if we stay up for hours after dark, sleep and mood problems may occur.4-6 Further, we are creatures of habit, and these patterns of behavior tend to become a lifestyle choice, setting our clocks out of balance.

Circadian clocks are also implicated in the control of energy balance, feeding behavior, and consequently in the regulation of body weight. A well-synchronized clock guarantees that all physiological and behavioral rhythms take place in a coordinated manner over the 24-hour period. Consequently, each body has a rhythm that is the perfect combination activity, pace, and rest.1-3

Unfortunately, we can lose contact with our own inner rhythm if much of our time is spent indoors, driving in our cars, and rushing through our days. We easily fall prey to life's manufactured cycles of work, lunch break, more work, dinner, mindless TV, email, and sleep. Moreover, this unnatural cycle may create a disruption in our inherently natural rhythms, leaving us feeling fatigued, bored, anxious, and off balance.

The most recognized circadian rhythm is the human sleep cycle. Sleep is controlled by neurotransmitters, which act on neurons in the brainstem and in the spinal cord. Signals produced by the SCN travel to different regions of the brain. It regulates other functions associated with the sleep cycle such as body temperature, hormone secretion, urine production, and changes in blood pressure.

The sleep/wake cycle in humans is dependent on light and temperature. A change in these could shift or disrupt the cycle. External factors that affect the circadian rhythm are called zeitgebers. A zeitgeber is any exogenous cue that synchronizes an organism's endogenous time-keeping system (internal clock) to the earth's 24-hour light/dark cycle and 12-month cycle. These include exposure to noise, meal times, work schedules, and daylight hours.7

The body's systems that control hormones, brain waves, and organ functions depend on a smoothly running body clock. The normal rhythm differs from person to person depending on the physi-
Get Back into the Rhythm

Being in rhythm is being prepared to deal with stressors in life and research suggests that applying the rhythm strategies, we can reduce stress, frustration, and guilt while increasing energy and feelings of satisfaction and wellbeing. Every system has its cycle and its pattern and its pulse and the steady beat is the organizer of biorhythms that influence our functions. When the ideal rhythm is lost, feelings of loss of control and balance emerge.

Circadian rhythm disturbances include such things as shift work, jet lag, stress, insomnia or even the switch to daylight savings time can lead to chronic fatigue. Fatigue that goes untreated or ignored will have both physiological and psychological ramifications that not only can jeopardize your personal health but can also become a safety issue.

There is emerging scientific opinion that the increased stress levels in our culture may be the direct result of being out of sync with our natural elements that strongly impact our physiological systems. To work and live at our best, we need our internal circadian rhythm in harmony and synchronized with our environmental cues.

Some experts recommend we can reset the clock by raising stress hormones in the morning with protein-rich foods and physical activity and keep them low at night. Regular exercise increases everyone’s cognitive capability and releases stress from our bodies. For most men, the best time to exercise is in the afternoon. Women who exercise in the morning raise their serotonin levels, prompting a positive mental state.

We make a thousand lifestyle choices every day. Those decisions either create or destroy the natural rhythm of our lives and may be the single biggest threat to our own well-being. Without even giving it much thought, we allow our short-term decisions to override what’s best for our long-term well-being.

Faster isn’t always better, bigger isn’t always better, louder isn’t always better. More isn’t always the solution. In today’s hectic world we often push ourselves to the limit, sometimes forgetting that our bodies, hearts, minds, and spirits all need time to refocus and recharge. Resetting our body clocks and the behavioral circadian rhythms related to the timing of sleep, meals, work and social interactions can enable us to maintain a more natural state.

Listen to the Beat

Stress causes our internal rhythms to lose synchronicity. Stress breaks down the immune system and leads to weakness, illnesses, and injuries. Physical factors like temperature, sound, vibration, movement and humidity all disturb your clock rhythms. Physiological stressors as sleep disturbance, irregular eating, alcohol and nicotine and caffeine also change our rhythms. Psychological stressors as fear, frustration, social problems, and work pressures all play roles in disturbing our natural clock rhythms.

Listen to the beat of the body clock for optimum health and well-being. We think faster, enjoy better health, do better work, and live longer when our time settings and environment cycles match.

References:

I got rhythm, I got rhythm...who could ask for anything more.

George and Ira Gershwin