Fibromyalgia is a connective-tissue disorder that is a fairly common syndrome. It is characterized by chronic, widespread musculoskeletal pain; multiple "tender points," fatigue; sleep disturbance; stiffness; and other symptoms such as headache, dizziness, trouble with concentration, irritable bowel syndrome, urinary urgency and depression. Fibromyalgia may occur at any age, even in childhood, and is much more common in women than in men. The cause of fibromyalgia is unknown. It is difficult to diagnose because many of the symptoms are similar to those of other disorders.

A hallmark of fibromyalgia is chronic pain. This could be due to neuroplastic changes resulting in central sensitization. Importantly, after central sensitization has been established, only minimal peripheral input is required for the maintenance of the chronic pain state. Additional factors, including pain-related negative affect and poor sleep, may contribute significantly to clinical fibromyalgia pain.

Central nervous system (CNS) dysfunction is the main pathophysiological mechanism in fibromyalgia. Current hypotheses center on atypical sensory processing in the CNS, dysfunction of skeletal muscle nociception, and the hypothalamic-pituitary-adrenal (HPA) axis. Sleep disturbances also involve CNS dysfunction. Many patients experience difficulty with concentration and memory and many others have mood disturbance, including depression and anxiety. Fibromyalgia is associated with substantial morbidity and disability.

Current research shows that patients with fibromyalgia experience pain differently from the general population because of dysfunctional pain processing in the CNS. Aberrant pain processing, which can result in chronic pain and associated symptoms, may be the result of several interplaying mechanisms, including central sensitization, blunting of inhibitory pain pathways, alterations in neurotransmitters, and psychiatric comorbidity conditions.

Ghrelin levels increase before meals and decrease after meals. Ghrelin is considered to be the counterpart of the hormone leptin, which is produced by adipose tissue and induces satiation when present at higher levels.

Patients with fibromyalgia may have mood disorders that are significant predictors of sustained pain. Therefore, it may be helpful to incorporate anxiety and depression scales as screening tools to better manage fibromyalgia patients.

The experience of pain can contribute to disturbances in sleep and sleep pattern. When evaluated by overnight polysomnography, fibromyalgia patients usually have interrupted periods of waking-type brain activity that result in sleep fragmentation. There is a decrease in delta and sigma waves but an increase in alpha and beta EEG frequencies during sleep. The alpha EEG patterns include phasic and tonic alpha EEG sleep as well as periodic K alpha EEG sleep or frequent periodic cyclical alternating pattern.

Both sleep duration and quality tend to be worsened in patients with fibromyalgia. Sleep has an upstream role in daily functioning and is directly correlated to negative affect. Thus sleep problems can play a critical role in exacerbating fibromyalgia symptoms. Limited findings also suggest that sleep may predict subsequent pain in this population and may be related to depression through pain and physical functioning. Anxiety and depression can cause distress and decrease quality of life, especially when combined with difficulty initiating and maintaining sleep.

Women with fibromyalgia and pain have fewer sleep spindles and reduced electroencephalogram power in spindle frequency activity compared with control women of similar age. During overnight polysomnography, stage 2 sleep was shorter in the fibromyalgia subjects. Researchers suggest that analysis of the lengths of individual sleep stages, in addition to the usual sleep stage amounts and percentages listed in standard polysomnogram reports, may have clinical use in the management of fibromyalgia patients.

The cyclic alternating pattern (CAP) is a long-lasting periodic activity consisting of two alternate electroencephalogram (EEG) patterns. This variation in EEG is closely related to fluctuations in the level of arousal that characterize two different functional states in the arousal control mechanism. In these patients with fibromyalgia the quality of sleep is lessened due to an increase in CAP of sleep. Rizzi and colleagues found that fibromyalgia patients had less sleep efficiency than controls, a higher proportion of stage 1 non-rapid eye movement (NREM) sleep, and twice as many arousals per hour of sleep. The CAP rate (total CAP time divided by NREM sleep time) was significantly increased in fibromyalgia patients compared with controls. CAP rate seemed to correlate with the severity of clinical symptoms in fibromyalgia and with lower sleep efficiency.

Fibromyalgia is often accompanied by chronic fatigue syndrome (CFS), which involves excessive daytime sleepiness. This subset of patients has significant differences from healthy controls in polysomnographic findings. Sleep disruption related to overwhelming fatigue and pain causes them to feel sleepier and more fatigued after a night of unrefreshing sleep.

Nonrestorative sleep is a common complaint in the general population, although its prevalence largely varies. Often it is associated with mental disorders and characteristics of sleep deprivation such as extra sleep time on weekends. This sleep pattern often affects working adults and is more likely to cause daytime impairment than difficulty initiating or maintaining sleep. One study compared subjects who reported having nonrestorative sleep with people whose sleep was restorative even though they had difficulty initiating or maintaining sleep. Subjects with nonrestorative sleep reported more frequent daytime impairments (irritability, physical and mental fatigue) than the subjects with

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insomnia, and they consulted a physician twice as often for their sleeping difficulties. It is common for patients with obstructive sleep apnea (OSA) to have periodic limb movements in sleep. Risk factors for the development of PLMS include OSA, fibromyalgia, diabetes mellitus, increasing age, predisposing medications, obesity, and OSA. Other sleep disorders that can co-occur with fibromyalgia include restless leg syndrome (RLS), bruxism, exploding head syndrome, and sleep myoclonus (a sudden rapid contraction of a muscle or a group of muscles during sleep or as one is falling asleep).

CONCLUSION
People with fibromyalgia experience lower quality of life due to pain, sleep disturbance, fatigue, depression, anxiety and cognitive impairment. Fibromyalgia can have a negative impact on social, mental, emotional, physical and occupational well-being. Sleep technologists should keep in mind that patients who have fibromyalgia may have comorbid PLMS, OSA, bruxism and alpha intrusions. These patients could present in the sleep laboratory with extreme anxiety, fatigue and other mental health issues.

REFERENCES