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Repetitive Stress and Strain Injuries: Preventive Exercises for the Musician

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Professional and amateur musicians commonly practice and play their instruments experiencing the physical pain of repetitive stress injury (RSI). Through improved understanding of the etiology and the acceptance of numerous lifestyle changes, including the addition of preventive exercises into the practice routine, the musician may be able to limit the effect of RSI on his or her life. The musician's intrinsic motivation to practice and to repeat motor patterns to perfection compounds the exposure to repetitive trauma [1]. Practice and performance postures are often less than optimal and serve as risk factors for increased RSI. Years, decades, and even centuries of customary practice patterns and schedules preclude the insinuation of ergonomically designed seating and instruments, safer and more comfortable practice methods, and playing positions. Both practice seating and performance seating are often folding or stackable chairs, or flat wooden benches. Lifestyle choices further contribute to higher risk for RSI. Lengthy practice sessions are customary, with short interruptions for fast foods, caffeine, or nicotine breaks. The musician may be unwilling to seek medical help early, because he or she is concerned that the physician will require the limitation of practice or performance times, or worse, instruct the musician to stop playing altogether. In addition, there is a social/work ethic concern about the label of an injured musician [2–5].

On the opposite side of the issue is the knowledge that the most effective treatment of RSI is prevention. Early detection and immediate intervention, within days or weeks of onset, may be effective in most cases for the most complete recovery [3]. Delays in seeking assistance, and delays in the initiation of appropriate care, contribute to severity of the injury and the need for long rest/recovery periods, surgery, or lengthy rehabilitation. Throughout the course of RSI, the musician experiences the loss of practice

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and performance ability, increased pain, and may lose the ability to perform on the instrument of choice completely [3].

Discussing repetitive injury in those whose craft involves precise repetition of motor patterns involves careful consideration, as muscle damage from repetitive trauma is thought to be dose-related. The longer the exposure to an injurious activity, the more likely pain and long-term harm will develop [6]. A phenomenon known as delayed-onset muscle soreness (DOMS) sometimes complicates the ability to notice the early onset of injury [2]. DOMS, well known in sports medicine, also applies to RSI of the musician. Because the onset of muscle pain may be delayed from 2 to 48 hours, the musician may continue playing well beyond the point of injury. As soreness ensues, the musician will adjust playing posture or technique to compensate for this pain. Muscles, tendons, and ligaments unaccustomed to demanding activity are more likely to be injured [2].

Etiology

The literature is replete with repetitive stress injury diagnoses. For the purposes of this article, neurological and muscle diagnoses will be included in the category repetitive stress injury. Other authors have correlated specific diagnoses to the postures and techniques associated with playing specific instruments. These may include repetitive grasping of the strings and neck of the violin, guitar, and cello, which may increase the risk of median and ulnar neuropathies (neurological) or lateral epicondylalgia (muscle). Percussionists are more likely to experience muscular inflammations. Postural requirements, such as supporting the violin with the chin while bowing, may increase risk for thoracic outlet syndrome and neck pain. DeQuervain's tendonitis may be a result of the acute flexion of the thumb for bowing. Balancing on the bench seat of an organ while playing with both hands and feet may contribute to the development of low and thoracic back pain [3–5,7,8].

Localized pain, weakness, cramping, and dystonia characterize muscle injuries. Tendonitis or tenosynovitis, epicondylitis, and focal dystonia are in this group. Muscle damage diagnosed as tendinitis is caused by microhemorrhages, tears at the tendon periosteal junction, and sprains and strains of the proximal tendon [2,6,9]. Extreme fatigue contributes to muscle ischemia and tendon creep [10], increasing the risk of muscle damage. Symptoms generally are localized, and the onset is often traceable to a specific incident.

The etiology of muscle dystonia is understood less well. The pianist is most at risk for this disability involving extra, unintentional movement of the fingers and painful cramping during use [11]. Muscle groups, such as the intrinsic hand muscles and long flexors of the thumb and fingers, contract uncontrollably, resulting in marked flexion of the digits, which is relieved only by discontinuing the activity and redirecting or resting the digits. Pianists are also prone to dystonia of the feet, and trombone players are at risk for dystonia of the facial muscles [8].