

# Abstracts from the Literature

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Elias I, Zoga AC, Raikin SM, et al: Bone stress injury of the ankle in professional ballet dancers seen on MRI. *BMC Musculoskel Disord* 2008;9:39. <http://www.biomedcentral.com/1471-2474/9/39>.

Ballet dancers have a relatively high incidence of stress fractures of the foot and ankle. The authors examined magnetic radiation imaging patterns of bone marrow edema (BME) in the ankles of high-level professional ballet dancers. The study group included 6 females and 5 males, aged 19 to 32 yrs (mean, 24). Two musculoskeletal radiologists and one orthopaedic surgeon evaluated images of 12 ankles for consensus regarding location and pattern of BME. They also reviewed images for presence of osseous, ligamentous, tendinous, and cartilage injuries to control for recognized sources of BME. The authors statistically measured the strength of the correlation between BME and ankle pain. Edema was present only in the talus and in 9 of 12 ankles imaged; it was associated with mild ankle pain during activity in all cases. Edema was ill-defined and centered in the talar body and neck. No occult stress fractures were found. There was a moderately strong correlation between BME and reported pain. There was no apparent gender predilection. The authors assume that the etiology of this BME relates to subclinical injury, trabecular reorganization in response to physical stress, or vascular proliferation in an area undergoing chronic excess stress. This latter is likely

due to the extensive axial-load stress which occurs in full-weight-bearing plantar flexion during pointe and demi-pointe positions. Thus, this specific finding is a sign of overuse injury and should suggest to the dance physician to evaluate the dancer's training regimen and possibly advise a decrease in training intensity.

Lã FMB, Ledger WL, Davidson JW, et al: The effects of a third generation combined oral contraceptive pill on the classical singing voice. *J Voice* 2007; 21(6):754-761.

The vocal mechanism is sensitive to changes in the endocrine environment. Despite a widespread belief among singers that vocal quality changes according to the stage of the menstrual cycle, this topic has received little research attention. Few studies have assessed the effects of oral contraception on voice quality, and no investigations have been carried out specifically regarding the singing voice. The authors report the first double-blind, randomized, placebo-controlled crossover trial of a drospirenone-containing oral contraceptive pill (OCP) on the regularity of the pattern of vocal fold vibration in nine professional Western classical singers while performing a German lied. The OCP (Yasmin, Schering) also has both anti-androgenic and antiminerlocorticoid effects, which minimize adverse (virilization) changes in the singing voice during administration. Measures of reproductive hormones and vocal fold vibration patterns were sampled during the menstrual, follicular, and luteal phases of the cycle. Digital acoustic recordings were supplemented by electrolaryngograph evaluation for frequency and amplitude variation in vocal fold vibration. Results showed a significant reduction in the irregularity of the vocal fold vibration pattern during

OCP use compared with placebo use. Highly trained singers might benefit from the use of this OCP, potentially avoiding the complaints of vocal distress associated with the menstrual cycle as reported in previous research.

Cooper C: The "comeback plan" for injured violinists. *Am String Tchr* 2007; 57(4):52-55.

Written by a university-level upper string pedagogue who recovered from a "frozen shoulder," this practical article provides violinists with a "road map" and common-sense guide to resuming effective playing after a musical absence. Despite the fact that the article is specific to the needs of string musicians in regard to technique and repertoire, the principles of musical rehabilitation presented here can be adapted to players of every class of instruments. Resuming play after an injury or overuse syndrome is a daunting task, but the musician can accomplish a great deal in small segments of time if he or she follows an organized plan of attack. It is necessary to determine what aspects of playing to work on first or what one is able to do at all. Beginning with daily 5-minute practice sessions, the musician is advised to keep track of technical and musical content, the body's response, and progress made. Technical aspects of playing, such as finger action, intonation, shifting, changing of notes (and chords), and bow technique, should not be addressed simultaneously, but the player should at first concentrate on a single aspect during the allotted practice time. Progression from basic to more advanced levels of playing will not occur at the same rate for all elements of musical technique, and awareness of this fact is necessary to avoid causing a recurrence or the development of new problems. One must not move to more demanding literature too

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soon, for the same reasons. The author provides references to numerous resources of music types and technical exercises whose use will assist the violinist or violist in regaining musical skills; she categorizes their difficulty into five levels of progress.

**Nebistinsky J: Different strokes: a percussionist's journey to recovery. *Percussive Notes* 2007;45(6):60–62.**

Playing music is a gift that many musicians take for granted. When this gift is interrupted or lost, for whatever reason, it presents a major challenge to the player. The 46-yr-old percussionist and teacher who wrote this article describes his recent stroke (cerebrovascular accident) and the combination of physical and mental occurrences he experienced during treatment and rehabilitation. Following the acute episode, he had residual left-sided weakness and coordination problems. He was able to utilize a combination of physical, occupational, and musical therapy to regain at least 95% of his prior musical performance skills and returned to a full percussion teaching program. He developed his own musical rehab program, beginning with simple exercises while keeping records of his progress. Several of his observations provide guidance for those in similar circumstances: beginning with individual aspects of playing and not trying to improve all aspects (or instruments) at once; developing a logical plan that utilizes remaining neural skills; learning timing and coordination in a non-musical way (but one that worked well for him); and realizing that his high level of motor training and performance skills permitted him to recover and rehabilitate more rapidly. Mental endurance also required rehabilitation, perhaps more difficult than the physical components, but was helped by the use of imagery as he listened to music while looking at his part. Reliance on his faith and experiencing spiritual growth during the prolonged process also was crucial in his ability to recover. Although not a scientific paper, the author's report deserves reading by all musicians (and indeed all performers) for the important lessons it imparts.

**Hodgkins CW, Kennedy JG, O'Loughlin PF: Tendon injuries in dance. *Clin Sport Med* 2008;27:279–288.**

Dancers by nature have very unique anatomic, training, and performance requirements and mentalities, all of which contribute to a distinct collection and pattern of pathologies and difficult approaches to treatment. Among the common problems are tendon injuries, especially about the foot and ankle. Many are secondary to poor technique, inappropriate training and performance, and unfavorable intrinsic factors. They often coexist with other pathologies of bone, ligaments, and psyche. The article begins with general sections on tendon anatomy, pathophysiology of injury and its response, and the specifics of a basic examination in the dancer. Following segments describe the anatomy, function, injury patterns, and treatment of the more common tendinopathies. Leading off is the Achilles tendon, followed by the peroneals, the posterior tibial, and flexor hallucis longus tendons. Differential diagnosis of pain in various areas of the foot and ankle is included, as are the indications and choice of imaging procedures. For all basic tendon problems, the standard conservative approach of rest, nonsteroidal anti-inflammatory medication, ice, and physical therapy is recommended. The authors repeatedly warn that using modalities without including physical rest in order to allow further participation is dangerous and only leads to further damage. They stress that the treatment be delivered correctly and that patient compliance be achieved. Surgical treatment is presented as one option in several types of tendon injury, either as a recourse when conservative care has failed or, in the case of Achilles tendon tears, as the principal method of treatment.

**Schmuziger N, Patscheke J, Probst R: An assessment of threshold shifts in nonprofessional pop/rock musicians using conventional and extended high-frequency audiometry. *Ear Hearing* 2007;28(5):643–648.**

Extended high-frequency audiometry measures hearing thresholds for

pure tones from 8 to 16 kHz. Its clinical value for the detection of noise-induced hearing loss has not been established conclusively. This study was intended to determine if noise has a preferential effect on the extended high-frequency range in a controlled noise exposure. The authors assessed temporary threshold shift in both conventional and high-frequency ranges, 0.5 to 14 kHz, before and after a 90-min music rehearsal session. The 16 subjects were nonprofessional pop/rock musicians aged 27 to 49 yrs (mean, 35) who had experienced repeated exposures to intense sound levels during at least 5 yrs of their music careers. During rehearsal, the equalized sound levels averaged 102.9 dBA, while maximal levels averaged 111.4 dBA. After the rehearsal, median threshold levels were found to be significantly poorer for frequencies from 0.5 to 8 kHz ( $p \leq 0.004$ ) but were unchanged in the high range of 8 to 14 kHz. Decreases in the median threshold values measured before the rehearsal were present across the conventional frequency range, most notably at 6 kHz, but were not observed in the extended range. The authors conclude that based on these results, extended high-frequency audiometry does not seem advantageous as a means of early detection of noise-induced hearing loss.

**Vogel I, Brug J, van der Ploeg PB, Raat H: Young people's exposure to loud music. *Am J Prevent Med* 2007;33(2):124–133.**

Many young musicians also listen to recorded music as a source of enjoyment; on average, people aged 14 to 20 yrs listen to >3 hrs of recorded music daily. The authors reviewed the available English-language literature to provide a descriptive summary overview of studies published before October 2006 on sociodemographic, psychosocial, and other correlates of risk and protective behaviors for hearing loss in people aged 12 to 25 yrs. They performed a structured search of PubMed, PsycINFO, and Web of Science databases, plus checking the reference lists of relevant articles. The protection

motivation theory was used as the theoretical framework for categorizing the psychosocial correlates. Included articles had to describe empirical data on the relevant population and at least one sociodemographic or psychosocial correlate. Thirty-three papers formed the study set, identifying correlates such as age, gender, school level, ethnicity, music preference, physical activity, social influence, and free supply of hearing protection. Only limited comparison of the studies was possible due to their heterogeneity in study design, sample, and questions and to the lack of application of theoretical models. Although this overview identified several useful sociodemographic and psychosocial correlates, it showed that there is a lack of theory-based empirical research on the correlates of young people's hearing conservation behavior during their leisure activities, especially on correlates of MP3 player use. They suggest more theory-based longitudinal studies in this at-risk group to assess these correlates in greater depth.

Hamdan A-L, Sibai A, Rameh C, Kanazeh G: Short-term effects of endotracheal intubation on voice. *J Voice* 2007;21(6):762–768.

The authors examined the vocal symptoms and acoustic changes perceived in the short period after endotracheal intubation and to determine any association between these changes and endotracheal tube parameters. Thirty-five subjects were examined preoperatively, and at 2 and 24 hrs post-

operatively. Vocal symptoms evaluated included hoarseness, vocal fatigue, loss of voice, throat clearing, globus pharyngeus, and throat pain; acoustic variables included average fundamental frequency, relative average perturbation, shimmer, noise-to-harmony ratio, voice turbulence index, habitual pitch, and maximum phonation time (MPT). These were related to the endotracheal tube parameters of duration of anesthesia, number of intubation attempts, tube size, cuff volume, cuff mean pressure, and emergence. Logistic and linear regression measures were used to make the associations. Vocal fatigue was associated significantly with increase in cuff volume and the number of intubation attempts. Throat clearing was associated significantly with the increase in cuff mean pressure. Only the increase in habitual pitch was associated significantly with the increase in cuff volume. The acute short-term effect of intubation is significant. The most important endotracheal tube parameters that affect vocal changes are the cuff mean pressure and volume. All vocal symptoms increased significantly except for globus pharyngeus at 2 hrs postoperatively. The acoustic parameters did not change significantly except for a decrease in MPT. At 24 hrs postoperatively, all vocal symptoms subsided with no significant difference to baseline values. The habitual pitch increased significantly, and the rest of the parameters remained comparable to baseline values.

Musacchia G, Sams M, Skoe E, Kraus N: Musicians have enhanced subcortical auditory and audiovisual processing of speech and music. *Proc Natl Acad Sci USA* 2007;104(40):15894–15898.

Musical training is known to modify the brain's cortical organization. Because differences between musicians and nonmusicians are seen in so many different brain areas, the authors reasoned that the musician's basic sensory mechanism for encoding sight and sound may also be specialized. They evaluated 29 adult subjects, 16 musicians and 13 nonmusicians; their mean age was 25.6 yrs; 14 were female. The musicians showed earlier and larger brainstem responses than nonmusician controls to both speech and music stimuli presented in auditory and audiovisual conditions, evident as early as 10 ms after acoustic onset. Phase-locking to periodicity of stimulus, which likely underlies pitch perception, was enhanced in musicians and strongly correlated with length of musical practice. Viewing videos of speech (lip-reading) and music (instrument being played) enhanced temporal and frequency encoding in the auditory brainstem, particularly in musicians. The results suggest that high-level, complex training, such as learning to play music, impacts encoding mechanisms in peripheral sensory structures. These findings have practical implications when considering the value of musical training in schools and investigations of auditory training strategies for people with speech-encoding defects.