

which most occurred in the lower extremity. The bibliography is extensive but not comprehensive, containing 87 references; although only 1 of the 87 is specific for dancers, data and results from many others can be extrapolated readily and with validity for dance activity. Many extrinsic and intrinsic risk factors have been implicated; however, there is little agreement with respect to findings. One extrinsic factor for which there is general agreement in the literature is that the use of ankle tape or brace decreases dramatically the incidence of ankle injury. With respect to dancers, only the history of previous lower extremity injury is associated with an increased risk of another injury, and it holds true for men and women. This may be due partially to the frequent occurrence of inadequate or incomplete rehabilitation. Four other factors have shown no association with injury potential: age, gender, body mass index, and joint range of motion. There is no difference between men and women in these data. The authors discuss some of the procedural differences and confounding factors that may help explain

the lack of agreement among these many studies. They note that useful future studies should be prospective and controlled, using a sufficient sample size to ensure valid data, and use established methods for identifying and classifying injury severity.

Bangert M, Altenmüller E: Mapping perception to action in piano practice: a longitudinal DC-EEG study. *BMC Neurosci* 2003;4:26. <http://www.biomedcentral.com/1471-2202/4/26>.

Playing music requires rapid auditory and motor processing. Brain imaging studies with professional musician subjects have shown that auditory stimulation produces a coactivation of motor areas, whereas silent tapping of musical phrases evokes a coactivation in the auditory regions. Whether this occurs via a specific cerebral relay station is unclear. The time course of plasticity has not yet been addressed. This article deals not only with the plasticity of motor representation, but also with the issue of auditory-sensorimotor integration in piano practice. Changes in

cortical activation patterns (DC-EEG potentials) induced by short-term (20 minutes) and long-term (5 weeks) piano learning were investigated during auditory and motoric tasks. Two musical beginner groups were trained. The “map” group was allowed to learn the standard piano key-to-pitch map. For the “no-map” group, random assignment of keys to tones prevented such a map. Auditory-sensorimotor EEG coactivity occurred within only 20 minutes. The effect was enhanced after 5-week training, contributing elements of perception and action to the mental representation of the instrument. The “map” group showed significant additional activity of right anterior brain regions. The authors conclude that musical training triggers instant plasticity in the cortex and that right hemispheric anterior areas provide an audio-motor interface for the mental representation of the keyboard.

## REFERENCE

1. Donison C: Hand size vs. the standard piano keyboard. *Med Probl Perform Art* 2000; 15:111-114.

# Letters to the Editor

**Editor's Note:** Book reviews are rarely objective, nor are they intended to be. They are expected to give the reader some idea as to the subject matter and quality of the reviewed book and give the reader a basis to decide whether or not to purchase and read the book. Often, the author of the reviewed book takes issue with the author of the review, as may be seen in the letters in any Sunday New York Times Book Review. In the December 2003 issue of MPPA (18:4, p. 173), Dr. David Steinhorn, a physician and amateur horn player, reviewed the book *Broken Embouchures* by Lucinda Lewis, Principal Horn in the New Jersey Symphony. Her response to the review is longer than the usual letter, but it represents an important example of the communication gulf that remains between musicians and physicians. If we are to advance the health of musicians, it is essential that we bridge this divide, and this exchange between reviewer and author-musician attests to this need.  
— A.G.B.

To the Editor:—I was quite surprised when I learned that there was interest in reviewing my book, *Broken Embouchures*, in *Medical Problems of Performing Artists*. The book was written for

professional brass players who have encountered performance-related embouchure problems and lip injuries and uses terminology unique to music and brass technique. Although I suspected that a non-brass player would have difficulty fully understanding our peculiar lingo, I had hoped that a review of the book might offer the performing arts medical community a new insight into how brass players suffer overuse.

Dr. David M. Steinhorn reviewed *Broken Embouchures*. Although he understood its message better than I would have expected from a musical layperson, I would like to respond to a few of his observations.

The book's primary weakness is its anecdotal nature, relying primarily on the author's personal experience and testimonies of colleagues and students. For the medically sophisticated reader, there is a large amount of lay wisdom with a paucity of scientific data regarding the various issues discussed. Although the book is intended as documentary rather than prospective, hypothesis-driven research, no effort has been made to quantify the incidence of embouchure problems amongst various brass players, the potential benefits of the exercises proposed, or the efficacy of one approach over another.

Dr. Steinhorn was certainly correct that *Broken Embouchures* does not offer any scientific data. It is not that sort of book. My intention was to offer a well-documented explanation to professional brass players of a perplexing dilemma. Nevertheless, allow me to offer some numerical food for thought.

I wrote my first article on the topic of brass players' overuse injuries for a British arts magazine in the early 1990s. As a result of that and subsequent articles, I was inundated with e-mails, letters, and phone calls from brass players the world over desperately seeking help. By January 2002, I had received 3,658 inquiries, all of which included a detailed description of each player's physical and playing symptoms. Roughly two thirds of these were from professional players.

Most players who contacted me had been suffering with lip pain or lip swelling or both when playing and had developed serious playing problems, including loss of endurance, trouble playing in the high range, and a lack of clarity in articulation. With few exceptions, the descriptions these players gave of their respective experiences were consistent. Although this information is anecdotal, in the aggregate, it is persuasive and more than enough on which to formulate an opinion.

Of these players, 97% reported that the onset of their lip pain or playing problems was preceded by a period of physically demanding playing (e.g., preparing for an audition, solo performance, cast album recording, getting back into shape after a layoff). Almost 89% had consulted at least one physician or dentist. Their lip pain, lip swelling, and playing problems continued even after medical treatment. Roughly 75% had taken a therapeutic holiday from playing of at least 2 weeks. Time off the instrument of *any duration* did not permanently resolve either their physical or playing problems. In addition, I had a smattering of inquiries from flute, clarinet, oboe, and saxophone players whose embouchure complaints were surprisingly similar to those of their brass-playing counterparts.

Although there are countless medical books and articles covering the wrist, hand, finger, elbow, shoulder, neck, and back problems of musicians, there is little devoted to overuse-related embouchure pain and injuries. There is a simple reason for that discrepancy. Most of the more common and well-documented, performance-related injuries (e.g., a carpal tunnel syndrome, tendinitis, back problems, bursitis) have fairly recognizable and diagnosable symptoms and also occur in the general population. There are well-established protocols for treating these conditions. In contrast, brass players' overuse-related embouchure problems and lip complaints are unique to their occupation, not found in the general population, are painful and troublesome only while playing, and are inextricably intertwined with embouchure technique. The lack of any successful medical approach for treating overuse-related embouchure pain and injuries indicates that the medical community, as a whole, has not yet figured out how to deal with them.

Dr. Steinhorn also stated:

Given the acknowledged idiosyncratic and multivariate causes of embouchure dysfunction for brass players, the author's approach to rehabilitating the injured embouchure may not be universally successful. Of additional concern is the author's mention of the breathing methods of Caruso and Jacobs without reference to the more widely available techniques of the Alexander method, which have benefited many performers.

Healthy playing mechanics (embouchure technique) are the only protection a brass player's lips and mouth have from the physically intense pressures of playing. Weak playing mechanics allows minor injury to be inflicted to the lips of a player every time he or she plays and is why players continue to experience lip pain, swelling, and playing problems long after the initial overuse event. Unfortunately, once a player's embouchure technique has been adversely affected, no amount of practice, medical treatment, or time off the instrument will totally remedy the problem.

In my experience, injured brass players who have been mired in what I call an "overuse syndrome" for a protracted period (in some cases for years) begin to experience permanent relief from their physical and playing symptoms only after they have successfully rehabilitated their weakened playing mechanics.

You might well ask why brass players do not know instinctively that their pain and playing woes are related to compromised embouchure technique. I wish I had an answer for that. Were it universally understood in the brass world, I would not have needed to write a book. Let me offer, however, that when a musician becomes proficient on his or her instrument to the extent that technique has become second nature, the mental involvement with the technical aspect of playing is replaced with a total intellectual focus on musical finesse.

Regarding my mention in the book of the Caruso and Jacobs methods but none of the Alexander technique, let me say that while Alexander is wonderful for relieving tension, it would do little to repair the underlying mechanical causes of a typical embouchure injury syndrome. The caveat I raise about the Caruso (which involves playing technique, not breathing) and Jacobs methods is that there are a limited number of people knowledgeable enough to teach either approach.

Yes, there are, as Dr. Steinhorn points out, other ". . . idiosyncratic and multivariate causes of embouchure dysfunction for brass players. . ."; however, in most players whom I have encountered with embouchure overuse, medical treatment has provided no permanent answers. Clearly, physicians have to begin reevaluating how they approach treating these injuries and to recognize how overuse undermines the embouchure's physical ability to configure mechanically; and players have to learn to communicate more effectively with their physicians. My hope is that *Broken Embouchures* will help improve that dialogue.

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