

A Painful Melody Prevention & Treatment of Musicians' Injuries

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In the first article on this topic, we covered the primary causes of injury while playing a musical instrument, some basic ways musicians can prepare their minds and bodies to avoid injury, and a few ways to adjust instruments to better fit the body.

In this article we discuss neutral posture and hand positioning for reduced risk of injury as well as treatment and rehabilitation for musicians' injuries.

Often musicians do not pay attention to their body. Therefore, they are unaware of postures that cause a variety of aches, pains, spinal stiffness, restricted nerve function, constricted blood vessels, immobile joints, and unbalanced muscle tone.^{1,2} Stresses to the neck vertebrae can result in problems with the spinal nerves that affect the ability of hands and arms to function normally.

Neutral Posture

An upright posture is the most stable, balanced and less stressful position. A posture which is twisted, leaning to one side or leaning forward will cause the muscles of the back and shoulders to work too hard to maintain a stable position.^{1,3} To achieve a neutral position you may need to make adjustments to your environment. For example, if you use a music stand, make sure it is at eye level so you aren't slumping to see the music. If you play in an orchestra, face the conductor and keep the height of the music stand just below him or her.

Following are suggestions for the piano, guitar, and violin or viola. There are many more suggestions for other instruments in Reference 1.

Stressful posture	Problem	Good posture	Solution
	<p>Hunched posture with strain on neck, shoulders, and back. Arms and hands tense.</p>		<p>Upright posture with weight on sit bones, head aligned with shoulders, arms and shoulders relaxed.</p>
	<p>Bent, twisted posture cramps upper torso and arms. Foot stool throws pelvis off balance, straining lower back.</p>		<p>Use a cushion (apoyo) on left leg to raise the guitar. Face forward and sit upright, with both feet flat on floor.</p>

Stressful posture	Problem	Good posture	Solution
	<p>Arched back, twisted neck, tense neck muscles squeezing instrument between chin and collarbone.</p>		<p>Lean back from ankles, face forward, support instrument on collarbone and chest, release neck muscles. Hold the instrument with scroll at mouth level.</p>

Illustrations courtesy of Reference 2

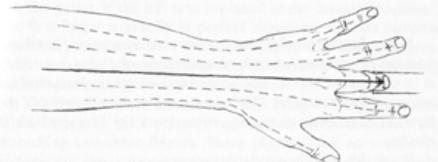
Balanced Seating

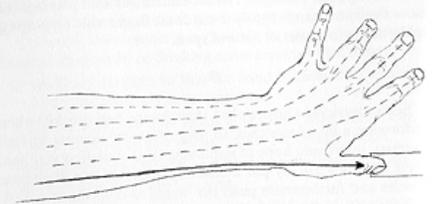
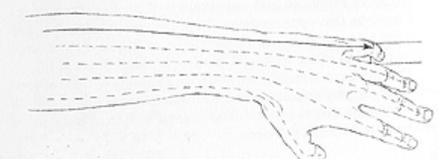
In order for the spine to be truly balanced over the “sit bones” that places the hip joint in its least stressful position, the seat needs to be slightly tilted forward.¹ Some chairs are designed to incorporate this tilt. For those without a chair with a tilt, place a foam wedge, a sloped cushion, or even a folded towel near the rear of the chair to provide the necessary tilt.¹ For many instruments such as the piano or the guitar, backrest and armrests are not desirable. These are good seating options:

	<p>Office Master CLVS</p> <ul style="list-style-type: none"> • Height adjustable from 17”-24” • Forward tilt adjustment. • Fabric • Approx. \$202 		<p>Office Master WS15</p> <ul style="list-style-type: none"> • Sit/stand dual positioning • Forward tilt adjustment with grooves in seat to prevent sliding • Urethane • Approx. \$194
	<p>Neutral Posture PS400</p> <ul style="list-style-type: none"> • Height adjustable from 24” – 34” • Forward tilt angle adjustment from 0-20° • Fabric • 30 lbs. • \$268 		<p>Neutral Posture TS400</p> <ul style="list-style-type: none"> • Height adjustable from 24” – 34” • Forward tilt angle adjustment from 0-20° • Urethane • 22 lbs. • \$268

Neutral Hand Position

The tendons and muscles of the forearm extend down into the hand. In order to minimize friction on these tissues, the hands and wrists should be positioned so that they are in a straight line without any unnecessary bends.¹ This requires a slight change in wrist and forearm position as shown below.¹

	<p>Forearm muscles aligned with the middle finger.</p>
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	<p>Forearm muscles aligned with the thumb.</p>
	<p>Forearm muscles aligned with little finger.</p>

Illustrations and text courtesy of Reference 1

This is not news to most pianists, but for many other musicians this concept has not been adopted.¹ Rather than adjusting the forearm and hand for each note, musicians tend to maintain a fixed position that requires the fingers to work in an unnatural position. This static hand posture causes muscle fatigue and tendon stress.¹

When more than one finger is used at one time, as in playing chords, a compromise position using the mid-point between the ideal position for each finger is recommended.¹ Priority should always be given to the comfortable positioning of the hands whenever the music permits, although occasionally the music demands awkward positions with no possible alternatives.¹ Take time to consider alternative fingering and hand positions when learning a new piece to reduce awkward and stressful motions that will be repeated many times once the piece is learned and played repeatedly.

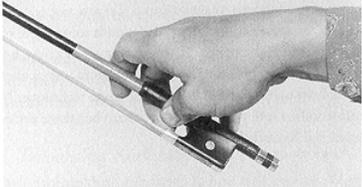
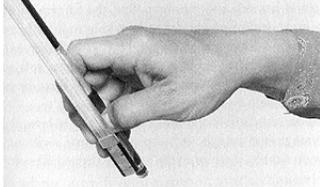
The thumb has the flexibility to move in a circular motion, whereas the other fingers move primarily in two directions - up and down. If the musician only moves the thumb forwards and backwards and does not allow it to circulate freely from its base joint, it can become stiff, unreliable, and susceptible to strain.¹

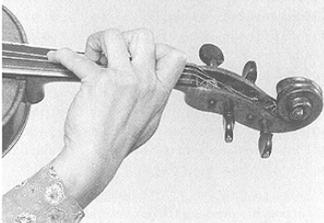
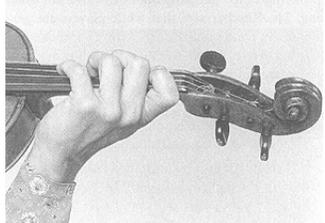
Joints function most efficiently in the mid-range of their potential range of motion.¹ Move each joint to determine its full range of motion and determine what the middle of that range is. The further from the midpoint the joint is moved, the more easily it will tire and the weaker it is.¹ The midpoint for the fingers is when the fingers are gently curved; the midpoint for the wrist is with the wrist straight and level.¹ This does not mean, however, that the wrists and fingers should be held rigidly in this mid-range of position. Joint movement should be flexible and fluid within the midrange of motion.¹

The examples below illustrate some specific cases where hand and finger position can be adjusted to reduce hand and wrist strain.

Stressful and stiff

Natural and flexible

	
<p>Holding the bow with the thumb flat causes bending and stiffness in the wrist, limiting movement.</p>	<p>By using a bent thumb, the wrist can move so that energy from the whole arm can transfer directly to the bow and onto the strings.</p>

	
<p>Placing the index finger on the fingerboard first requires the other fingers to awkwardly stretch into position.</p>	<p>By placing the little finger on the fingerboard first in a comfortable position, the other fingers find their places naturally, especially for people with small hands or short fingers.</p>

Illustrations and information courtesy of Reference 2

		
<p>Keeping the little finger in the hook of the trumpet and gripping the instrument too tightly requires the fingers to arch too much. The horn is pulled too tightly into the face, possibly injuring the lips.</p>	<p>Keeping the little finger in the hook of the trumpet and playing with flat fingers causes stiffness in the hand and arm.</p>	<p>By letting the little finger rest on top of the hook and easing the grip on the trumpet, the hand has flexibility and is in a natural position. Pressure on the lips is greatly reduced.</p>

Illustrations and information courtesy of Reference 2

Many instruments, including the piano and string instruments, use hand positions that require rotation of the forearm. The figure below shows what happens to the two forearm bones, the radius and the tibia, when the palm of the hand is rotated.² When the forearm is rotated, the two bones form an "x".² The space between the two bones contains muscles, tendons, and connective tissues. This space changes shape when the forearm is rotated, but it does not close up.²

Use of forearm rotation can add power to many of the springing motions and trills on the piano. It relieves the small finger muscles from a lot of motion.² Using a more rotated forearm with the violin or other string instrument usually makes it possible for the fingers to fall where they are needed, although too much rotation is not good.²

The important thing to remember with forearm rotation is to use it to relieve the fingers from awkward positions and unnecessary muscular motion. Always keep the forearm muscles relaxed. If the forearm muscles are tensed in a rotated position, the space between the two bones can become restricted and cause friction in the tendons and connective tissues.²

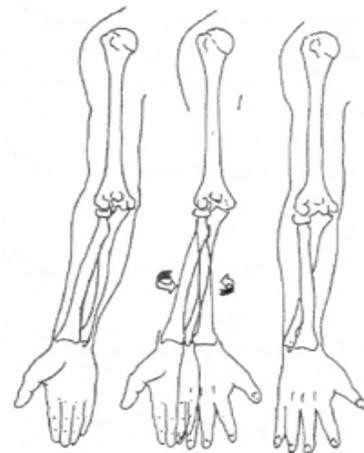


Illustration courtesy of Reference 2

Releasing Hand Tension

It is important to learn to control the amount of hand effort used to play a musical instrument.¹ Even when the rest of the body is relaxed, there is often a lot of tension in the hands while playing. To reduce unnecessary tension, fingers should operate independently so that the muscular effort of the finger being used does not result in muscular activity of the fingers not being used.¹ (Note: The ring and little fingers are an exception to this rule. They are connected by ligament filaments so trying to isolate them can be injurious.¹)

All tension should be released once the note or chord has been played.¹ Conscious release of tension in the fingers and hand when they are not required for playing a particular note may take practice. Try some play-relax exercises. For example, play a scale slowly, one note at a time, relaxing all fingers not involved in playing the note and relaxing the whole hand between notes.¹

When playing most stringed instruments, the thumb is often injured because it is used in a gripping action with sustained pressure on the thumb joint.¹ Usually the thumb only needs to be resting lightly behind the instrument neck.¹ Very little effort is actually required to keep the neck stable.¹ A good exercise to demonstrate this is to play slowly while lifting the thumb away from the instrument neck on alternating notes.¹ With many wind and brass instruments, the thumb helps to support the weight of the instrument, but the musician should experiment with using less effort and less gripping, or possibly using a strap to help support the weight of the instrument.¹

In general, when playing an instrument, there are many factors that can be modified to eliminate strain on the fingers without reducing the sound. Repositioning the arms and hands, using the weight of another body part, or using the strength of larger muscles of the arms and shoulders can reduce the force required by the small finger muscles.¹

Treatment of Musicians' Injuries

The chances of recovery for many musicians are generally good as long as proper care is taken before disabling pain is experienced. The approach one chooses to treat an injury is a personal choice, but it is important because it will affect the outcome.

Finding the combination of treatments that works best for you is usually a matter of trial and error. Treatments that work together to facilitate the healing process will correct imbalances and weaknesses that led to the injury. Consult with a health care practitioner to determine if there is a physiological source of the problem, if damage has occurred to the body tissues, and what the course of action should be to recover from the injury.

If you choose to see a medical doctor, the treatment will likely involve injections with steroidal anti-inflammatories, splinting, and, if there is nerve entrapment, surgery.³ If you choose to see a chiropractor in conjunction with massage therapy and/or other alternative therapies, the underlying source of the pain and weakness—muscle tension and myofascial thickening (the tissues encapsulating muscles)—will be reduced. Aligning the spine through manipulation, especially in the neck area, can affect nerve integrity to the arms and hands.⁴ Acupuncture can increase the flow of energy (chi) throughout the affected areas.

We recommend a combination of alternative therapies (e.g., Alexander technique, Feldenkrais, acupuncture or acupressure, psychological counseling, physiotherapy) because it tends to have a high success rate. Use of splints, taping, or wraps are temporary solutions to a serious problem. They can restrict circulation, cause atrophy of the muscles in the affected area through restricted use, and decrease flexibility.⁴ Steroid injections should be avoided because they have long-term health hazards and they mask pain, allowing continued overuse of the injured tissues and causing further damage.¹ In some cases these high power anti-inflammatories are necessary if other

treatments have not reduced the inflammation that is causing nerve compression. In very rare cases surgery is the only option. It should be considered after all other possibilities have been tried and exhausted.^{3,4}

One of the most important things to do is to consult with a respected teacher or colleague. Try to identify whether there is something in your technique, posture, or mental attitude that is causing the problem. As we have mentioned, a neutral body posture, correct positioning of the arms and hands, a positive mental attitude and relaxed muscles can reduce problems immediately.

Regardless of the instrument being played, three things happen with RSI: Muscular grip strength in the hand muscles is diminished, neural integrity is compromised, and the muscles are extremely sore.⁴ Denial is not a good solution. Recognize right away that something is wrong and be proactive in finding a solution to facilitate healing. If you wait, you will have to deal with the depression that goes along with having to give up the instrument that brings you joy.

Educate yourself

Knowledge is an extremely important weapon in your defense against injury. Though the field of Performing Arts Medicine is quite new, there is a wealth of information already available. Much of it is written for injuries specific to a particular instrument. We do not address each instrument in these articles, but we give examples to raise your awareness about what you might be doing incorrectly.

Please refer to the following resources to learn how to prevent and treat injuries associated with your instrument:

- 1) *Musicians and Injuries* for a comprehensive list of current books and articles on the many facets of musicians' injuries.⁵
- 2) *Medical Problems of Performing Artists: Official Journal of the Performing Arts Medical Association* for informative, online articles.⁶
- 3) The Chiropractic Performing Arts Network website for a holistic approach to musicians' injuries. Through this site you can learn about proper nutrition, stretches, and exercises, sign up for Dr. Jameson's free "Musician's Health & Wellness Newsletter", and order [The Musician's Guide to Health and Wellness](#).⁷
- 4) [Musicians' Injuries: A Guide to Their Understanding and Prevention](#), and [The Art of Practicing: A Guide to Making Music From the Heart](#), two excellent books.

Rehabilitation

How quickly you recover from injury is directly related to how long you continued to play through pain or discomfort. In cases of severe injury, complete recovery is not possible. However, if you are proactive, acknowledge that something is wrong, and come up with a plan to correct things before you are severely injured, your recovery will be much quicker and less likely to require drastic measures.¹ If an injury has continued for several months, further complications can arise such as adhesions (layers of body tissues grow together due to chronic inflammation or microtrauma), scar tissue from cumulative trauma, and atrophy of muscles no longer used.¹ The steps below outline recovery from a severe injury.¹

- *Stage 1:* If the injury is severe, complete rest combined with regular, professional treatment is necessary at first. This stage can be extremely difficult for people who are very involved with music, since it requires putting the instrument away completely.¹ It may be wise to leave the instrument with a friend who does not live close by.¹ Depression is highly likely following the loss of the ability to make music. Counseling can help you deal with this sense of loss and facilitate your healing by developing a positive attitude.¹

- *Stage 2:* Once chronic pain or acute symptoms have subsided, mobility can be restored through careful activities and exercises with plenty of rest between times.¹ Some everyday use of the hands is healthy during this stage, but it's important to avoid any activities that provoke pain or other symptoms.¹ Learn new ways of using the body including balanced posture, less muscular tension, and stress reduction. Continued regular treatment and guidance are essential throughout this stage.
- *Stage 3:* This is the time to slowly and carefully return to playing the instrument so as not to get re-injured. Ask an expert to analyze your technique and hand and body positions, and to recommend alternative ways of playing that are less stressful to your body.¹ Most people are not aware of their destructive habits, whether they are muscular, postural, or emotional.¹ Making adjustments to technique can be frustrating to an experienced musician because the movements and techniques must be re-learned and will feel wrong at first.¹ Starting over with new movements will take time before they feel natural.

This stage can be very difficult to follow, because the first inclination will likely be to rush into playing as if everything were healed.¹ Initially, start to play one minute in the morning and again for one minute in the afternoon, if no symptoms arise from the morning session. During the second day, progress to two minutes in the morning and again in the afternoon.

There will be days when the pain returns and little or no practice will be possible. If you play when you are in pain, you will quickly return to the acute stage of injury. For this reason, it is not possible to chart out a return to normal playing as if rehabilitation were a train schedule.¹

The healing process is slow and likely to have setbacks, so it is important to be in tune with your body and follow the limitations it sets.¹ It may be helpful during this stage to explore different types of therapy, such as Feldenkrais, to reinforce neutral posture and healthy body movements and habits.¹

In conclusion, we sincerely hope you will take time to evaluate your technical and emotional approach to playing your instrument. If you do experience problems, address them immediately by consulting a health practitioner and a musical expert to determine the source of your problems. Start working on alternatives and treatment. If you are already beyond this point and are experiencing significant limitations in your playing ability, face the fact that you should cut back or discontinue playing for a while during your healing process and do not rush back into playing as soon as the pain subsides. Healing of body tissues is a slow process and requires much patience, but it is possible.

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This article and all of our articles are intended for your information and education. We are not experts in the diagnosis and treatment of specific medical or mental problems. When dealing with a severe problem, please consult your healthcare or mental health professional and research the alternatives available for your particular diagnosis prior to embarking on a treatment plan. You are ultimately responsible for your health and treatment!

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3. *Playing the Piano: Playing with Fire? A Study of the Occupational Hazards of Piano Playing*, by Jonas Sen, Sept. 1991, University of Nebraska-Lincoln, Engineering Electronics Shop.
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