

A Painful Melody: Repetitive Strain Injury Among Musicians

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Music is truly one of the joys in life. Playing an instrument allows you to express many emotions in a very personal and beautiful way. While it is an excellent form of stress management, playing an instrument is physically demanding, especially when stressful positions are required due to the design of the instrument.¹ However, musicians are often in awkward postures when they don't have to be. In addition, they abuse their bodies, forget basic ergonomic rules, and fall into the same bad habits as people sitting at a computer workstation.

Overuse injuries are a serious threat to all musicians, whether or not they play professionally. Repetitive Strain Injury (RSI) is highly likely if musicians practice and/or perform daily and use their hands and arms all day at work. This series of articles will focus on what you can do to prevent injuries before they happen, or treat them if you are experiencing problems now.

Surveys of symphony orchestras found that 64% to 76% of musicians were experiencing RSI that affected their performance.² These high percentages don't even take into account the many musicians who have had to abandon their careers due to serious injury.² Professional musicians rarely admit having an injury since nobody wants to hire an injured musician.³ The pressure on professional musicians is greater than ever before. It is a stressful career requiring long hours of practice and repeated performances demanding peak performance each time. Musicians who travel often suffer from sleep deprivation and poor nutrition. These are all major contributing factors of RSI.

If you play a musical instrument as a hobby, you are not subject to the same pressures as a professional, but that doesn't mean you can't get hurt. In fact, if you are playing for pleasure and no longer take lessons, it's easy to forget some of the basic principles about posture, hand position, and technique. Without an observer, it's easy to slip into bad habits that cause injury.

Instrument Design

Before we discuss the reasons musicians get hurt while playing their instrument(s), we should mention the factor of design. It is important for musicians to evaluate their instrument to determine if there are changes or modifications that could make it easier to play.⁴

Questions to consider include: Is the instrument too large or awkward for you? Could you use lighter strings or reeds? Can you get tailor-made lifts or extensions, such as for keys on a flute? Can the end pin of the cello be lengthened so that you can sit more upright?⁵ In addition, think about ways to transport and hold your instrument safely: Is there a strap that could help you hold it? Can you get a cart to help you transport your instrument if it's large, like a string bass?⁴

There are a few manufacturers who are trying to fix design problems.⁶

1) Little Guitar Works produces a custom-crafted bass with a twisted neck to keep the musician's wrist in a more natural position.⁶ It can be rotated and customized to the musician's specifications.



Photo courtesy of www.littleguitarworks.com.

2) Bluthner makes a grand piano that allows the left-handed musician to play the lead with the dominant hand.¹

Causes of Overuse Injury

RSI occurs in musicians for several reasons:²

- misuse or inefficient use of the body
- lack of general fitness
- chronic muscle tension
- undeveloped upper-arm, shoulder and back muscles
- stress (psychological or emotional)
- fatigue
- ill-health
- playing “cold” without warming up the muscles before practicing
- insufficient rest breaks

There are certain ways of using the body that can lead to injury much sooner. These include.²

- awkward or asymmetric posture
- sustained or prolonged muscle contraction
- movements that require a lot of strength or force
- fast repetitive movements
- raised arms
- deviated wrist positions
- strong gripping action with the thumb

The amount of stress on the body is a cumulative total of all of these factors, so when several risk factors are present, the potential for injury is much greater.² The good news is that all of these stresses can be either totally eliminated or at least minimized.²

Injury Prevention While Preparing to Play

The first principle of injury prevention is to treat your body like your most expensive possession because it enables you to play music! Before starting to practice or play, prepare your body, mind and heart for the music you are about to make.⁵

The following six steps are recommended before you play. They will only take a few minutes. They will improve the music you produce and change the nature of your practicing and performing.

How does this preparation help to avoid injury? By preparing the body, you can warm up your muscles and increase your flexibility. By preparing your mind and heart, you can play more mindfully. You will be more relaxed and will play with ease...tensions from the outside world that create mental and emotional stress will neither interfere with your playing nor increase your risk of injury.




1) Warm up and stretch. Most sources emphasize the importance of preparing your body for practice by warming up and stretching prior to playing.^{2, 4, 5, 7} Not warming up and stretching places a huge amount of stress on the hands and fatigues the rest of the body.² To increase blood flow to the muscles, ligaments, and tendons, gentle whole-body exercises are recommended.²


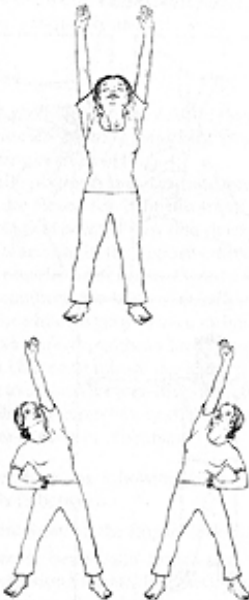



Start warming up with gentle exercises such as standing with your feet shoulder width apart and swinging your arms freely from left to right in a very relaxed, loose manner.² Do some arm circles forward and backwards, raise your arms, bend your elbows, circle your shoulders.² Then stretch some of the smaller muscles of your hands with opening and gripping motions.² Finally, start doing some slow, gentle exercises on your instrument to warm up the specific tissues required for that activity (e.g., slow scales or arpeggios).²

Stretching should be done following warm-ups to avoid muscle strains.⁵ Stretches should never hurt. Hold each position for a few seconds and then relax a few seconds in between.²

Regular stretching exercises maintain natural flexibility of the joints and keep the muscles working smoothly.^{2, 5, 7} Stretching allows you to let go of tension. The muscles in the back, neck, buttocks and backs of the legs tend to be cramped from daily activities.⁵ Increasing spine flexibility frees the spinal cord and motor nerves that control the muscles and lead to the sense organs, so stretching can increase sensitivity to sounds and sensations, in addition to improving the ability to move the fingers, hands, joints, and muscles.⁵ Breathing fully while you stretch makes space inside the body so the organs can expand and move more freely, bringing you into a more complete engagement with the music you play.⁵



Here are some examples of whole body and smaller muscle warm-ups and stretches you can use prior to playing. There are thirteen whole body exercises recommended and depicted in Reference 5; however, stretches not pictured here are difficult for people with any type of lower back problems.

 <p>Side-to-side twist This is a good warm up to start with. Swing your arms side to side very loosely like a rag doll.⁵</p>	 <p>Standing twist Bend forward, place your right hand loosely around the inside of your right knee. Stretch your left arm up toward the ceiling and turn your head to the left, trying to see your left hand. Repeat on the other side.⁵</p>	 <p>Neck and Shoulder Stretch Clasp your left wrist with your right hand and hold it in back of your head. Pull your arms to the right and then to the left. Repeat with the other hand.⁵</p>
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 <p>Arm twist Cross your right arm over your left at the elbow in front of your body. Move your two forearms toward each other and press your left fingers against your right palm. Close your right hand. Repeat with arms and hands reversed.⁵</p>		<p>◀ Reach for the sky</p> <p>First reach up with both hands, then reach up with alternating arms, bending to the right and left.²</p>
 <p>Bend the neck forward as far as it will comfortably go, then back. Hold each position for a few seconds to feel the muscles release, then rest before the next stretch.²</p>	 <p>Turn the head right as far as it will comfortably go, then turn the head left. Again, hold each position for a few seconds to feel the muscles release, then rest before the next stretch.²</p>	 <p>Tilt the head to the right, then to the left. Hold each position for a few seconds to feel the muscles release, then rest before the next stretch.²</p>

Illustrations courtesy of 5, 2

Wrist and hand stretches.

 <p>Forearm Flexor Stretch Place a cushion or folded towel on a table in front of you. Place your hands on the cushion with fingers relaxed, not spread apart. Straighten your arms and lean your body forward slightly without putting weight on your hands and wrists.⁵</p>	 <p>Forearm Extensor Stretch Extend your left arm in front of you with your elbow straight. Let your left hand drop from the wrist, place your right hand on the back of the left hand above the fingers and pull the left hand toward you to stretch out the top of the left hand. Reverse and do the same for the right hand.⁵</p>
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Finger Flexor Stretch

Gently bend each finger and the thumb back as far as it will go, one at a time and hold for a few seconds. Never pull back until you feel pain!²



Finger Extensor Stretch

Straighten all the fingers to extend the finger joints.²

2) ***Be present in body, mind, and heart.*** As a musician, you can understand the psychological part of preparing to play. You need to engage with the music and with your surroundings, letting go of the other things that are occupying your mind when you sit down to play.⁵ Empty your mind of clutter, become aware of everything around you, and focus on the music you are about to play.⁵ If you are performing, you can tune into the energy of the audience; if you are practicing, you need to feel comfortable with your surroundings.⁵

3) ***Sit upright and balanced.*** Upright posture is important while preparing to play as well as while playing.⁵ As we get older, we tend to slouch. Upright posture means sitting with the weight of your torso on the two bones at the base of your pelvis. Your head and body should face forward, your feet should be solidly on the floor, and your chin level. This will allow you to relax and breathe properly.

4) ***Breathe.*** Focus on your breathing for a couple of minutes.⁵ Most people tend to rush their breathing or hold their breath.⁵ During this phase of preparation, you don't need to breathe any special way; just focus on your breathing, especially breathing out. Focusing on breathing tends to quiet your mind and make you feel more relaxed. By taking a break and doing nothing, you will feel more refreshed and your playing will become freer and smoother.⁵

5) ***Notice your environment.*** Now expand your awareness to your body on the seat, the air, the light, the sounds around you, the ground beneath your feet, and the space around you.⁵

6) ***Relax and approach playing with ease and joy.*** With a composed state, you are relaxed and alert. Because you project a calm confidence and receptiveness to your environment, you will be able to accommodate to whatever is happening around you.⁵ Tune into your heart. Be in touch with your longing for love, for music and for life; penetrate the heart's protective shield and all the layers of mental and emotional preoccupations.⁵ These things will bring life to your music by moving the center of your focus from yourself to the emotions in the music.⁵ Practicing should not be an obligation; it is connecting to the heart and mind of a great composer. Through this, we connect with and nourish ourselves.⁵

Injury Prevention While Practice and Playing

To prevent injuries, it is important to use your body in a comfortable and natural way.⁵

1) Use techniques that facilitate natural positions and movements. Many musicians are not aware of the harmful, long-term effects of stressful hand or joint positions, unnatural movements, or excess muscular tension.² Through education in physiology, body mechanics, and body awareness, techniques can be modified so musicians can perform in a neutral posture with little or no tension on muscles, tendons, and other soft tissues.^{2,5} The person who employs effortless coordinated technique will be far less likely to become injured.³

Instrumentalists tend to grip too hard with their hands.⁵ Playing with relaxed muscles improves your power and range of motion as well as endurance, speed, and control.⁵

2) Take Rest Breaks. Breaks are the most effective injury prevention strategy.^{2,4,5} Everyone has a different threshold at which rest is required. This threshold is lowered by fatigue, depression, or illness. 45 minutes to 1 hour is the maximum anyone should practice without taking a break; 25 to 30 minutes is often recommended.^{2,5} Take a 10 to 15 minute break, then return to playing.⁵ If you feel you need more practice, it is recommended to study the music away from the instrument, which can help you learn the piece while allowing your body to rest.²

3) Avoid use of arms and hands during a break. Breaks are necessary to help your hands and arms recover from the work they have just done.² They will not recover if you do other activities that use the same muscles as those used to play your musical instrument. Lack of rest can cause overuse injuries.^{2,4} Home improvement projects and writing or typing can add cumulative stress to the same hand, wrist, neck, back and shoulder tissues needed to play the instrument.

4) Do not over practice. Every person's time limit for practicing is different. It is affected by physical conditioning, health issues, and pre-existing tissue damage and muscle tension.² Very few people are genetically resistant to injury.³ Shorter periods of intelligent practice are more productive than hours of mindless repetition.² Intensity of practice multiplied by time spent practicing is extremely important when determining the breaking point for injury.³

5) Start slowly when trying a new instrument or working on a challenging piece. Muscles and tendons usually adapt to work they are required to do, but they need time to strengthen. Pace yourself if you are starting a new activity or restarting something after a long break. If a new piece contains strenuous chords, awkward stretches and/or difficult fast passages, the hands are suddenly being put under more strain than usual.² Take time to work through difficult passages slowly and calmly. Isolate the cause of the difficulty and work out different fingering or hand/arm movements to make the passage easier.²

Over a period of days, time spent on the new activity can be gradually increased to allow muscles and tendons to adapt without risking muscle fatigue and injury.² Pacing yourself is especially important when you are preparing for a recital or concert, attending a music camp, or participating in several different music groups.⁴

6) Avoid stress and tension. Mental and emotional stress causes muscle tension in the neck, shoulders, and back muscles which can put strain on the spinal joints and emerging nerves.² In addition to being fatiguing, muscle tension in the upper body can be the source of many problems in the arms and hands.² **Numerous authorities are convinced that tension in the body, arms, and hands is largely to blame for injuries and disabilities among musicians.**^{2,3,5,8} **This is closely related to proper posture and positioning of the hands and arms. It is also a result of negative emotions, depression, anxiety or frustration.**³

Relaxation is imperative to enable natural movement. Feldenkrais, Yoga, Alexander Technique, counseling, and breathing exercises are examples of effective relaxation methods.³

7) Do not play through pain. As with athletes, musicians who experience pain often continue practicing and playing, hoping that the pain will go away.^{2,8} Pain is an indication that something is wrong. Continuing to play with pain will cause further damage.^{2,8} If you notice tension or discomfort, stop and let it subside, and try to determine the source of the tension.^{5,8} Seek advice on your technique and medical help for the symptoms.^{4,5,8} All pain should be taken very seriously!^{4,8}

8) Respect your physical requirements. Choose pieces that suit your physical abilities.⁵ Hand size, shape, and flexibility vary a lot between people. It is risky to choose pieces that require excessive reaching with the fingers if you have small hands. People with extremely flexible hands often do not have a lot of strength, so pieces with reach are fine, but power and reach can cause injury.^{3,5}

In the next article we will talk about neutral posture and hand positioning for reduced risk of injury, as well as treatment and healing from musicians' injuries.

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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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