Overuse Injury and Prevention in Musicians

By: Mrs. Lisa Broyden MS, OTR/L
A little bit about myself..

Occupational Therapist: Specializing in Hands and Upper Extremities
Fun with Anatomy

Understanding the mechanics of:
Muscles
Tendons
Nerves
Bones
Ligaments

Understanding the effects of:
Passive insufficiency
Overstretch
Therapeutic stretching
Compression (especially nerves)
Thought this would be easier.

- muscles, tendons, and passive insufficiency
- dog leash analogy: slack = harder to pull
- make a fist with wrist EXTENSION, then
- make a fist with wrist in FLEXION
- !!!!!!!!!!!!!!!!!!!!!!!!!!!!!
- the “accordion“ analogy: structure position in overstretch vs. scrunched
- therapeutic stretching = allows muscle and tendon fibers refill with oxygen and blood, changes in position are good.
Fun with Nerves

Nerves:
- Nerve structure analogy: electric cord through cylinder shaped tunnels
- Ulnar = controls ring and pinkie
- Try it now!
- Hose analogy: decreased flow
- Compression = (cubital tunnel syndrome)
- Median = controls thumb, index and middle
- Try it now!
- Compression = (carpel tunnel syndrome)
Nerve Gliding Concept

- Spinal cord is like trunk
- nerves like branches
- stretch positions for nerves is the same concept as stretching muscles
- NERVE FLOSSING!
* Who knew??*

MORE LATER
Brass instruments

- Trombone
- Tenor horn
- Baritone horn
- Euphonium
- Baritone horn
- Tromba
- Tuba
- French horn
- Trumpet
- Cornet
- Flugel horn
- Natural trumpet
Vocal students

- This is good stuff for you to know
- Watch your body positions too
- You might also teach....
Injury statistics

The prevalence of musculoskeletal disorders in instrumentalists is relatively high, ranging from 73.4% to 87.7%
Yo Yo Ma, Ma is a highly respected international cello soloist. He was injured during a practice in August of 2004. His injury was caused by an RSI (repetitive strain injury), in his wrist which was a result of his longtime profession.
Mr. Peter Oundjian, who developed RSI and suffered permanent loss of fine motor control in his left (fingering) hand had to resign after playing for 15 years as first violinist of the Tokyo String Quartet. The accident was an error in the routine maintenance of his instrument, leaving the vertical angle of the strings minutely altered. The injury stemmed from his violin strings not being properly positioned causing the overuse injury.
Repetitive strain injury (RSI)

RSI is caused by stress-inducing movements in playing and can be divided into two categories:

1) isotonic movements: these are sophisticated and fast movements that are designed to produce sound (these movements include touching the fingerboard, playing the piano or keyboard and bowing)

2) isometric movement: these movements serve to stabilize the instruments for prolonged periods in unstable postures. Repetitive movements associated with increased muscle activity that stabilizes the wrist, elbow and shoulder girdle load stress on the surrounding tendons; over time, this can lead to pain due to chronic tendinopathy
Violinists and violists complain frequently of neck and upper extremity pain because of their posture, which involves holding their instrument between chin and shoulder, flexing their elbow with extreme supination of the forearm and wrist for prolonged periods, and repetitive bowing with the right arms.
Bass Players complain of back pain because they have to stabilize their instruments with their trunk and play with their trunk leaned forward.
Pianists

Pianists often present pain around the scapula and wrist due to overuse.
Brass Players

Brass players, as well as other wind instrument musicians often complain of pain involving 1) the embouchure (the adjustment of the mouth and facial muscles and the positioning of the tongue and mandible so that the lips will vibrate when blown through) and 2) the breathing apparatus - the diaphragm, the rib cage, the intercostal muscles, and the glottis which must be correctly coordinated to work in conjunction with and maintain efficient vibration of the lips and 3) the upper body from holding the instrument in a comfortable yet steady playing position. This requires strong but relaxed skeletal muscles, particularly of the arms, shoulders, fingers, and even the legs of those players who stand while playing.
Clarinetists and oboists often complain of symptoms on the joint of the right thumb especially at the metacarpophalangeal joint, because they hold their instruments mostly with their right thumbs.
Flutists usually complain of left neck, shoulder and wrist pain due to the non-ergonomic playing shoulder abduction position.
Percussionists:

Percussionists may have wrist symptoms due to the repeated snapping of the wrists and fingers.
More about Repetitive Strain injuries (RSI)

There are more than 100 different kinds of syndromes colloquially called repetitive strain injuries (RSIs). Repeating the same motions (ISOTONIC) or sitting in one position for too long (ISOMETRIC) or both, causes them.

Most common are:

- Carpal tunnel syndrome
- Cubital tunnel syndrome (in the elbow)
- Deqreveins syndrome
Carpel Tunnel Syndrome:
What else could cause CTS?

- Typing
- Writing
- Knitting
- Bike riding (holding handlebars for long periods of time)
- Data entry
- Construction
Cubital tunnel (inside elbow) Lateral Elbow pain (outside) images:
What else could cause elbow issues

- Golf, tennis, pitching
- Painting
- Raking, rowing
- hammering, using a screwdriver
De Quervain’s Disease:
What else can cause DeQuervain’s?

- Wringing out wet clothes.
- Hammering
- Skiing.
- Knitting.
- Lifting heavy objects such as a jug of milk, taking a frying pan off of the stove, or lifting a baby out of a crib.
What Can You Do???
USE YOUR MIRRORS PEOPLE !!

If it looks wrong, it usually is

The mirrors are in every practice room for a reason!! (and its not to check your hair or makeup !!)

You need to find a balanced position (watch your ISOMETRICS) with a fluid motion (watch your ISOTONICS). You need to find your fluidity, especially in long and difficult passages.
Later there will be more on what to do!
Leon Fleisher was among the leading American pianists of his generation, but was stricken with a debilitating condition in his right hand called FOCAL DYSTONIA, which forced him to withdraw from public performance in 1965.

He had a concerto made just for him, that he could play with just his LEFT hand.

He also turned to conducting, but until the late '90s rarely performed music for two hands.
Focal dystonia:

Focal dystonia is characterized by abnormal involuntary sustained muscle contractions in a single body part and is task-specific. Focal task-specific dystonia is a work-related condition because it is the result of a particular movement that is repeated forcefully over a long period of time. In string players, the loss of control and involuntary movements of the left fingers are the most common symptoms.

Dystonia is a neurological disease affecting the brain's ability to fire neurons (which control muscle movement) correctly. Focal dystonia specifically affects one particular area of the body and is usually completely isolated, affecting only one activity.
Phil Smith

Philip Smith (born 1952) is an eminent American classical trumpet player. He is former Principal Trumpet with the New York Philharmonic and played with the orchestra from 1978 to 2014.

He retired in 2014 because he suffered from a form of Embouchure Focal dystonia.
Embouchure Overuse syndrome
(in the focal dystonia family)

- Embouchure “overuse”—or in simple terms, playing "too much."
- Most brass players at some time experience lip swelling (or "stiff lips"). Sometimes, continuing to play despite this, the stress can cause a chain of injuries that lead to embouchure overuse.
- Generally speaking, the best way of overcoming swollen lips is to refrain from playing temporarily, or to practice for a shorter period of time and with a good warm-up in the days following any period of extensive playing. When a player is deprived of the opportunity to recuperate after a period of extensive playing, the simple matter of swollen lips is not allowed to heal, and the player is forced to work harder to compensate for diminished lip strength. This can cause Embouchure overuse.
What Can You Do??
David Leisner’s system for focal dystonia

David Leisner is a guitarist, considered one of the “finest guitarists of all times” since 1975. After years of playing, he developed focal dystonia. Although much remains to be learned, he developed a system of treatment to ease his symptoms, which led to his regaining the full use of his right (plucking) hand.

www.youtube.com/watch?v=KqxI4uSkB9w
EVALUATE:

In general musicians often need to reduce force, find postures that keep joints in the middle of their range of motion, use larger muscle groups when possible, and reduce body usage that involves fixed, tensed positions.
INFORM YOURSELF. Take time to read up on resources related to your pains

(There are a lot of resources at the end of this lecture)
**ALWAYS WARM UP.** Athletes do not abruptly start vigorous physical activity without warming up and stretching because they know it is an invitation to injury. Musicians are putting athletic demands on fine motor musculature and should similarly be religious about warming up before practice or performance. The amount of time you warm up depends on how you feel that day. (Generally 10-15 min)
TAKE LOTS OF BREAKS TO **STRETCH** and **RELAX**. This means both momentary breaks every few minutes and longer breaks every hour or so. *This may be the single most important thing to remember.* Constant tension and repetitive motion does not allow the body to flush away metabolic waste products and this is traumatic to tissues over time. Even in the middle of playing a piece you may have a moment to relax a hand or arm to restore circulation. The marathon rehearsals that musicians pride themselves on have great potential to hurt us. Emerging research on athletes reveals that overtraining actually decreases performance. Try two or more shorter rehearsals in a day rather than one long, intense session, and limit total time on your instrument.
Nerve glides !!

[http://www.askdoctorjo.com/content/neural-glides-ulnar-median-radial-nerves](http://www.askdoctorjo.com/content/neural-glides-ulnar-median-radial-nerves)

LET’S DO IT !!!!
When to Seek Medical Attention

**GET MEDICAL HELP.** Therapists and doctors know that musicians are notoriously hard to persuade to reduce or stop their playing to allow injuries to heal, and some instructors (or even parents) may tell students to ignore pain, or accuse them of trying to avoid practice. But "No Pain, No Gain" is a disastrous policy for a musician. *If it hurts, back off.* THIS IS SERIOUS STUFF: is it worse to have to not play for a few months . . . or to risk a permanent injury, disability, pain, and never playing again? Also, I hear of musicians with pain who are afraid to see a doctor because they may find out they have a difficult injury. **It's better to know the truth and do something about it.** Don't put off seeking treatment if you are in pain.
PACE YOURSELF!!

PACE YOURSELF.

It is very common for musicians to notice injury when we are...

- preparing for recitals or concerts
- attending music camps
- heavily involved in multiple musical groups

Not surprising, because all of these can radically increase our playing time and exceed the limits of our body.
WHAT ELSE ARE YOU DOING ??

**EVALUATE OTHER ACTIVITIES.** Your problems may be caused or aggravated by other things you do frequently. *Computer use* is a notorious example, but sports, carrying children, hobbies, and excess effort/tension in other daily things may have enormous impact too.
PAY ATTENTION!!

PAY ATTENTION TO YOUR BODY. Pain is your body yelling that it's in big trouble, but learning what is comfortable or awkward for your body before you're in pain may prevent injury. "Physical re-education" through The Feldenkrais Method, T'ai Chi, yoga, The Alexander Technique, stretching, or dance classes all may be helpful.
CHECK OUT YOUR INSTRUMENT. Are you using an instrument that is too large or awkward for you? Is it set up optimally for you? Tiny differences in playing action or tension can make a HUGE difference. Could you use lighter strings or reeds? Is there a strap or stand that could make playing less stressful? If it's big and heavy (like a string bass), can you get a cart to help transport it? And remember: if it is a new instrument, especially a larger one, you need to take time to adjust to it before you plunge into intense use of it.
BE MINDFUL OF “EXERCISES”

- **BE CAREFUL WITH STRENGTHENING METHODS.** Building up muscle strength with special devices (GripMaster, putty) or musical exercises (Hanon) is very controversial. *If you are already injured and in pain, such things may make it worse.* And overdoing musical exercises while using bad technique, poor posture, or too much force may only speed you along to trouble. On the other hand, if you are not yet injured, or are undergoing rehabilitative therapy, properly conditioning muscles may help prevent injury or re-injury. **Be patient** in building strength, and **talk to a qualified doctor or occupational therapist.**
by Nicola Culf
Nicola Culf has done musicians everywhere a service by packing into one slim volume (100 pages) a succinct and comprehensive account of the risk for injuries among musicians, and the means by which such injuries can be avoided. This contribution is notable in that it covers the whole range of music making; touches on every aspect of the problem, including practice habits, pain management, technique issues, recovery; and presents a wealth of fundamental, critical information quickly, efficiently, and readably.
I would hope that the economy and accessibility of Culf's writing make this a title widely read in our music schools as a matter of routine, and not simply a title that instrumentalists who are already injured and alarmed seek out after the fact.
This book can be ordered online at www.parapress.co.uk or mail-order from: Parapress Ltd, The Basement, 9 Frant Road, Tunbridge Wells, Kent TN2 5SD (UK), Tel:(01892) 512118
THE MUSICIAN'S SURVIVAL MANUAL:
web A Guide to Preventing and Treating Injuries in Instrumentalists.
Richard Norris, M.D.
International Conference of Symphony and Opera Musicians, 1993. ISBN
0-918812-74-7
MMBMUSIC.INC. Tel: 314 531-9635; 800 543-3771 (USA/Canada) ST262 $16.95 Web
Site here.
"The book is aimed at an audience of performers. It has chapters on recognition and
prevention of injuries, thoracic outlet syndrome, some of the nerve entrapment
syndromes, tendinitis, also "therapeutic exercise for musicians" and "returning to play
after injury", among others. Very readable." (quote from Ann Chukurian) It had
important insights for me as a musician, and much also applies to computer users.
Musicians who are computer users need to read it. Here’s the Table of Contents
Appendix B (a list of performing arts clinics) from this book is included on my FindADoc
list.
Order MUSICIAN'S SURVIVAL from Amazon . . .
Resources: books

TEXTBOOK OF PERFORMING ARTS MEDICINE
"The textbook is more for health care people. It has information on how to diagnose and treat many problems performers have, including tendon/muscle problems, also things like hearing loss, vocal nodes, and problems specific to dancers. I found it very useful when I was first starting to research my problems ("tendinitis" in forearms), especially when I needed to tell the doctor what to do. ...(has) extensive bibliographies. If your library doesn't have it, you could request that they be borrowed for you via interlibrary loan." (quote from Ann Chukurian)
Note: this book is connected with the quarterly journal MEDICAL PROBLEMS OF PERFORMING ARTISTS, which can be found in some University libraries.
Order TEXTBOOK OF PERFORMING ARTS from Amazon . . .
Resources: books

PLAYING (less) HURT: An Injury Prevention Guide for Musicians.
Janet Horvath
Performing Arts Medicine Association | Dedicated to the health of...

www.artsmed.org/

Organization of physicians and other allied professionals dedicated to improving the health care and treatment of performing artists through education, research...

Symposium · About · Referrals · Events
Full list of resources to browse

http://rsi.unl.edu/music.html
THANK YOU!!
PLAY SAFE !!