

# Performing Arts Medicine

## Osteopathic Principles in Music Medicine

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# Objectives

- History and purpose of Performing Arts Medicine (PAM)
- Clinics, associations, literature, resources, and conferences
- Notable studies in PAM
- Famous musicians with a variety of medical problems affecting their performance
- Performance related/caused medical problems
- Performance affecting medical problems, but not performance related
- Epidemiology
- Instrument specific problems
- Musician History, Physical, and Structural Examination
- Treatment

# Definition

- Performing Arts Medicine (PAM) is a branch of Occupational Medicine involved with the care and treatment of musicians, dancers, singer, and actors. It is analogous to sports medicine for the athlete. Physicians in PAM work closely with the specialties of Physical Medicine and Rehabilitation, Neurology, Hand Surgery, Rheumatology, Otolaryngology, Orthopedic Surgery, and Sports Medicine to provide performing artists comprehensive care.

# History and Origin of PAM

- The Australian orthopedic surgeon Hunter Fry, M.D. was one of the first researchers to investigate the prevalence rates of medical problems among musicians. Some of his earliest studies were conducted on symphony orchestras and high school musicians.
- He determined that 64% of symphony orchestral performers and 56% of high school music students experienced pain when playing or had an overuse injury from playing.
- [Incidence of overuse syndrome in the symphony orchestra](#)  
*Hunter J.H. Fry, Medical Problems of Performing Artists. Vol. 1. Number 2. June 1986.*
- [Music related overuse in secondary schools](#), *Hunter J.H. Fry, Peter Ross, Martin Rutherford, Medical Problems of Performing Artists. Vol. 1. Number 4. Dec 1988.*

# Richard Lederman, M.D.

- Beginning in the late 1980's, Dr. Lederman, a neurologist at the Cleveland Clinic, became known for treating musicians in his clinic. He is one of the founders of performing arts medicine, and has authored numerous publications and books on the subject.



# Alice Brandfonbrener, M.D.

- She founded the Performing Arts Medical Association (PAMA), wrote numerous publications on PAM, treated musicians since the late 1980's at the Rehab Institute in Chicago, and is co-author with Dr. Lederman on the Textbook of Performing Arts Medicine. Passed away 2014.



# Performing Arts Medical Clinics

- Medical Program for Performing Artists, Chicago (Brandfonbrener)
- Medical Center for the Performing Artists, Cleveland Clinic (Lederman)
- Miller Institute for Performing Artists, New York
- Health Care Program for Performing Artists, San Francisco
- Louisville Arts in Healing Program
- TCOM Performing Arts Medicine Clinics – Saj Surve, D.O.
- Texas Center for Music and Medicine
- Others exist which involve physicians with special interest in PAM and are likely members of PAMA

# Performing Arts Medical Associations

- PAMA - Performing Arts Medical Association:  
<http://artsmed.org/>
- International Association for Music and Medicine:  
[iammonline.com](http://iammonline.com)
- British Association for Performing Arts Medicine: [bapam.org.uk/](http://bapam.org.uk/)
- International Foundation for PAM: <http://www.ifpam.org/>
- International Association for Dance Medicine and Science:  
[iadms.org/](http://iadms.org/)
- Australian Society for Performing Arts Healthcare (ASPAH):  
<http://www.aspah.org.au/web/>
- Many other organizations exist internationally as well as informative web-sites such as Healthy Performers  
<http://www.healthyperformers.com/>



# Associations for medical professionals and performing artists are devoted to:

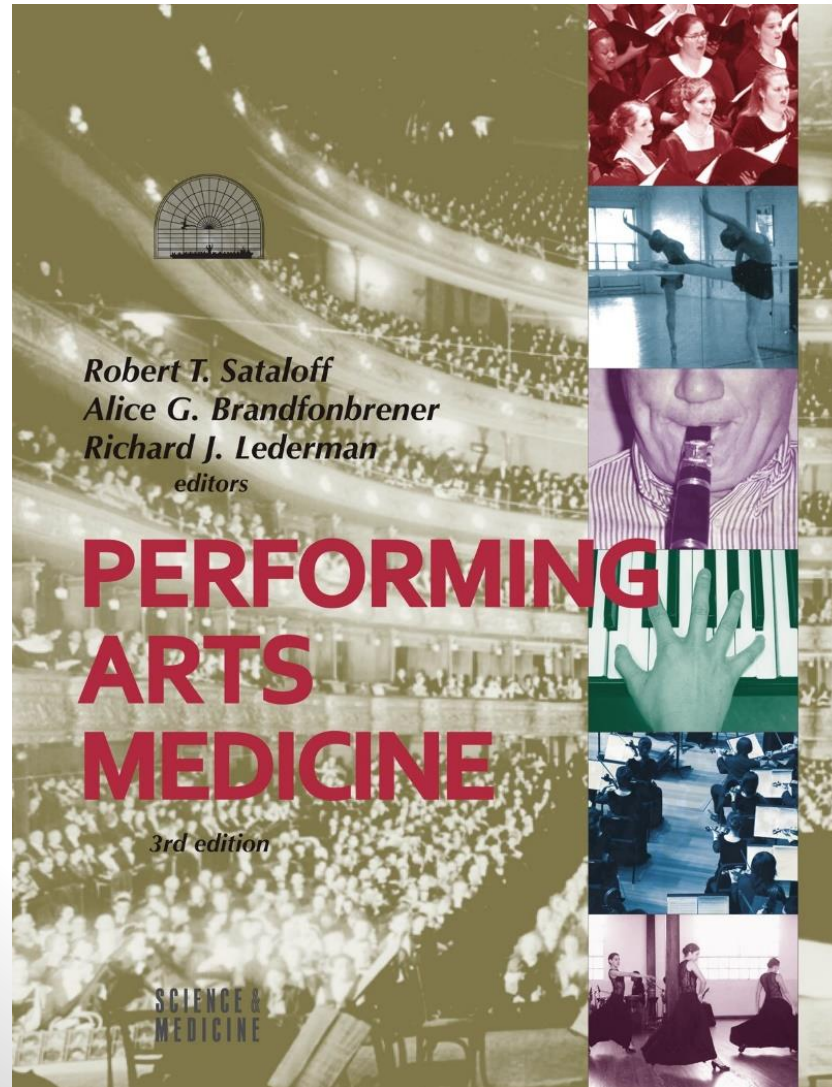
- Promoting health related information among physicians, performers, managers, and teachers in the performing arts.
- Fostering research into the etiology, prevention, and treatment of health problems common to the performing arts.
- Developing educational programs designed to provide informed and appropriate medical care for the performing artists.

# Performing Arts Medical Literature

- *Textbook of Performing Arts Medicine* 3<sup>rd</sup> edition, <http://www.sciandmed.com/mppa/>
- *Journal of Medical Problems of the Performing Artists*
- *Music and Medicine*
- *Journal of Dance Medicine and Science*
- *Journal of the International Arts Medical Association (out of print)*
- *Musicians' Injuries: A Guide to Their Understanding and Prevention.* Nicola Culf.
- *Playing Less Hurt.* Janet Horvath.
- *The Musician's Survival Manual.* Richard Norris.
- *You are Your Instrument.* Julie Lyonn Lieberman
- Musicians and Injuries List of Books. <http://rsi.unl.edu/music.html>

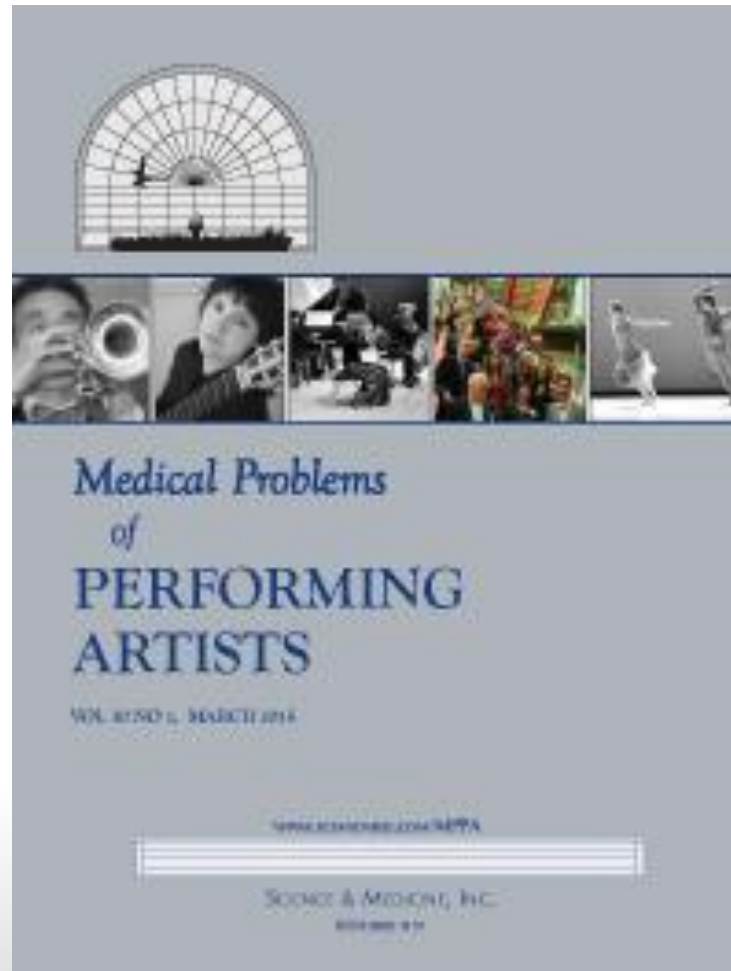
# Textbook of Performing Arts Medicine

3<sup>rd</sup> edition



# Journal of Medical Problems of Performing Artists

<http://www.sciandmed.com/mppa/>



# Music and Medicine

The official journal of IAMM

[mmd.iammonline.com](http://mmd.iammonline.com)

mmd.iammonline.com

## MUSIC AND MEDICINE

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**Noteworthy: The Music in Music and Medicine**

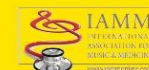
Guest Editors

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Joanne V. Loewy, DA, LCAT, MT-BC & Ralph Spintge, MD





<http://www.iadms.org/?page=47>

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# Performing Arts Medical Symposiums

- **Annual Symposium of Medical Problems of Musicians and Dancers (Performing Arts Medical Association)** – Held in Snowmass, Colorado.
- The Voice Foundation's Annual Symposium
- The Biology of Music Making, Annual International Conference
- Advances in Performing Arts Medicine, Annual Symposium
- Symposium on Music Medicine
- American String Teachers Association
- Health Promotion in Schools of Music Conference

# Why Study Performing Arts Medicine?

- The special needs of a musician are not well known by many physicians
  - Performance schedule
  - Physical demands of playing with repetitive fine motor control motion
  - Potential loss of earning power during an injury
  - **While not specifically trained in the care of the performing artist, osteopathic physicians have OMT expertise that can be of great benefit to the performing artist**
- Studies show a high incidence of performance related injuries – it's common!



# Notable Studies in Performing Arts Medicine

## *Medical Problems Among ICSOM Musicians*

The first large scale study ever conducted on performing artists was done by Martin Fishbein on the population of musicians in the International Conference of Symphony and Orchestral Musicians (ICSOM). Over 4000 professional musicians from the 48 ICSOM orchestras were surveyed. A total of 2212, representing 50% of the musicians responded to the self-completed questionnaire. Results indicated that 82% of the orchestral musicians surveyed experienced a medical problem and 76% experienced a performance related medical problem that affected their playing.

Martin Fishbein, Susan E. Middlestadt, Victor Ottati, Susan Straus, Alan Ellis: Medical Problems Among ICSOM Musicians. *Medical Problems of Performing Artists*. Volume 3. Number 1. March 1988.

# Additional Studies Related to the Incidence of Problems in Performing Artists

- Fry: Incidence of Overuse Syndrome in the Symphony Orchestra
  - <https://www.sciandmed.com/mppa/journalviewer.aspx?issue=1152&article=1514&action=1>
- Fry: Prevalence of Overuse (Injury) in Australian Music Schools
  - <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1007775/>
- Shoup: Survey of Performance-Related Problems Among High School and Junior High School Musicians. Medical Problems of Performing Artists. Volume 10. Number 3. September 1995.
  - <http://www.sciandmed.com/mppa/journalviewer.aspx?issue=1115&article=1209>

# Injuries of Some Famous Musicians

- Many famous musicians have had to adapt to disabilities, injuries, or medical problems that were either performance related or non-performance related.
- Here are some notable injured performers who were successful in spite of their injury...

# Phil Collins – Nerve Damage

- An extremely successful drummer and songwriter suffered a neck injury and after subsequent surgery, developed nerve damage causing chronic pain in his hands. More recently he suffers from hearing loss.



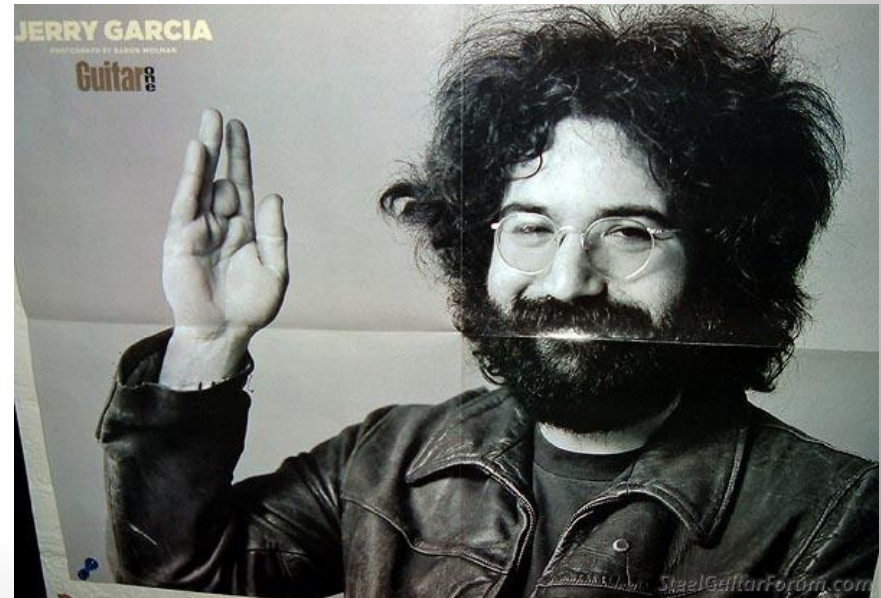
# Gary Graffman – Focal Dystonia

- Famous pianist who developed focal dystonia of the right hand, forcing him to quit a successful career, until he discovered he could write and play one-handed piano works.



# Jerry Garcia – Finger Loss

- Garcia started playing the guitar long after he lost a finger during a wood chopping accident that occurred when he was only four.

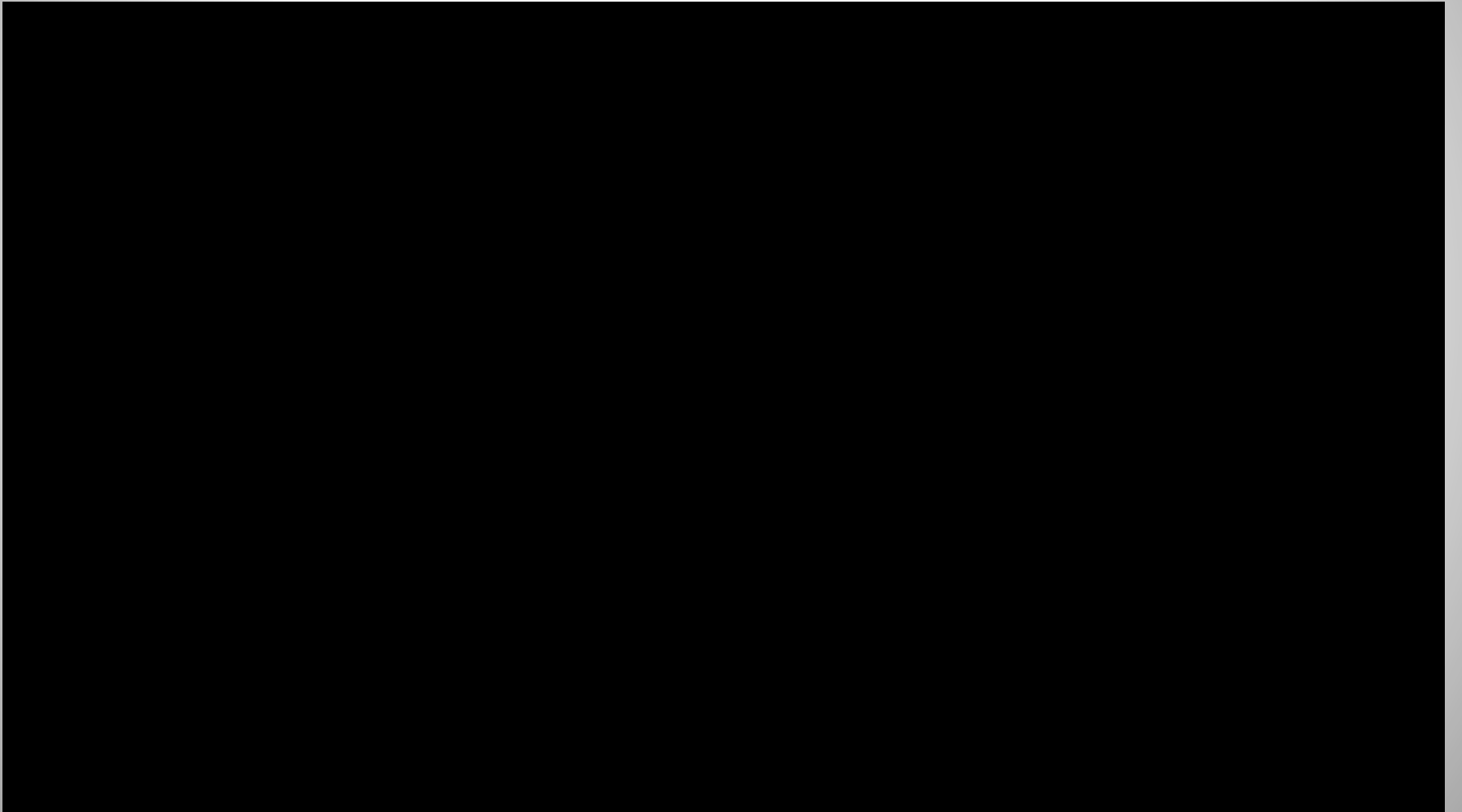


# Django Reinhardt – Paralysis of his 4<sup>th</sup> and 5<sup>th</sup> fingers

- He was the first important European jazz musician (1940's) who made major contributions to the development of an entirely new style of jazz guitar technique sometimes called 'hot' jazz guitar.



# Django Reinhardt





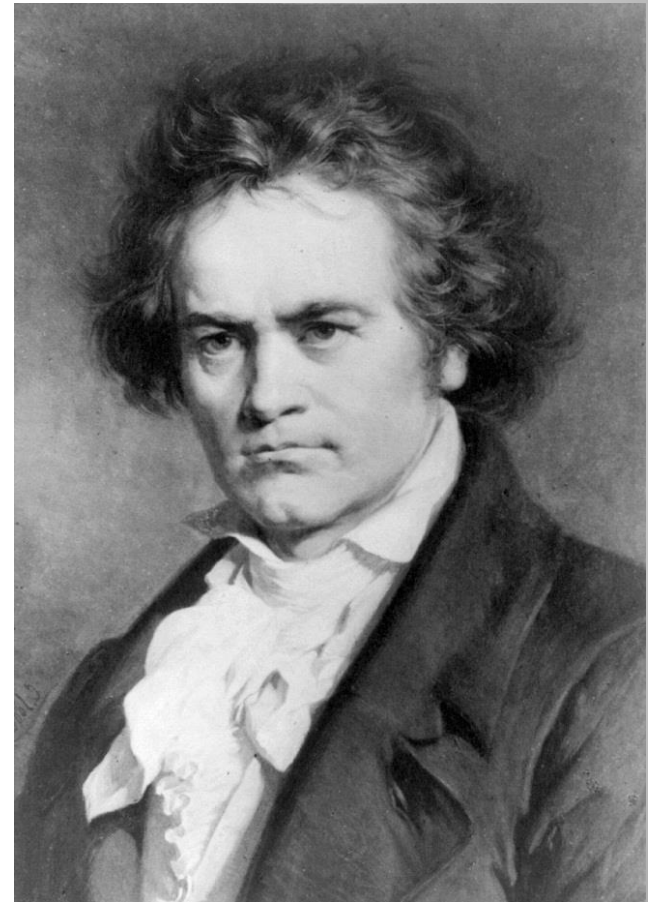
# Itzak Perlman - Polio

- Many consider Perlman the greatest violin player of the 20th century. He contracted polio at the age of four, but made a good recovery, and learned to walk aided by crutches. He plays violin while seated.



# Ludwig Van Beethoven - Deafness

- His name is synonymous with musical mastery. He composed several well-known symphonies, concertos, and sonatas. He achieved all this despite being completely deaf for the last 25 years of his life. He is presumed to have had Paget's disease which deformed the bones of his skull and ear causing his deafness.



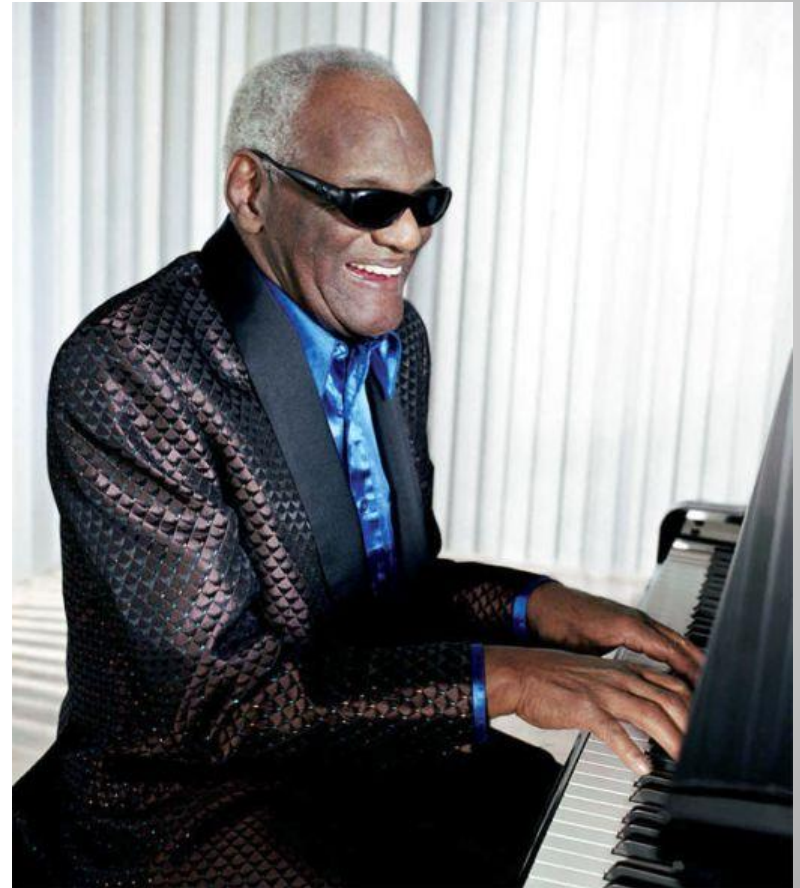
# Tony Iommi (Black Sabbath) - Finger Loss

- An industrial accident in a sheet metal factory led to partial amputation of 2 fingers on his right hand. He considered quitting music, but a record by similarly-injured jazz guitarist Django Reinhardt encouraged him to keep playing. He wore plastic covers over the two damaged fingers so that he could continue playing. He also discovered that by tuning his guitar to lower pitches, the strings were easier to play. He formed the band Black Sabbath, selling 20+ million albums, and becoming a highly influential guitarist.



# Ray Charles – Blindness

- Charles is an American singer, songwriter, and musician who mixed gospel, blues, and country in the 1950s and 1960's. He suffered from glaucoma induced blindness from age 7. Rolling Stone magazine ranked him number ten on their list of "The 100 Greatest Artists of All Time."





# Kenny G - Asthma

- Asthmatic Kenneth Gorelick is a Grammy-award winning saxophonist. His smooth jazz expanded the jazz market exponentially and sold 48 million records, making him the 25th highest selling recording artist in America. One of his most successful albums is titled “Breathless”.



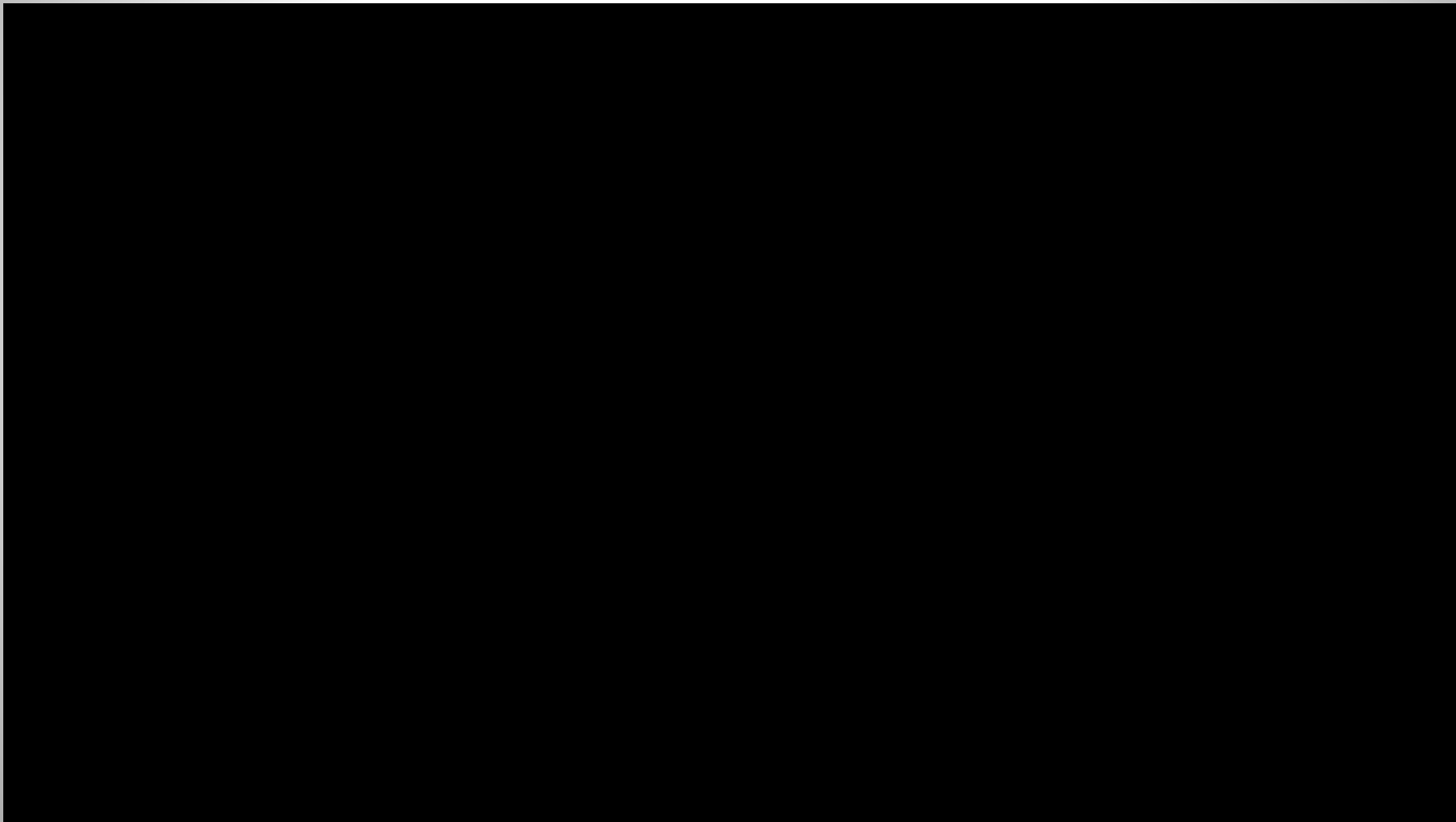
# Rick Allen (Def Leppard)

## Arm Amputation

- Allen was involved in a motor vehicle accident and his left arm was severed. Allen thought this was the end of his career and he began to suffer from major depression.
- Desperate to play again, he met with a few engineers and designed a drum set that could be operated with only one arm and both feet.



# Rick Allen



# David Shoup, D.O – Left Hand Tendinitis

## My Personal Interest In PAM

- My personal interest in PAM and the osteopathic profession began with a development of tendinitis in my left hand from overuse.
- As a teenager, I was playing the guitar and fiddle 8-10 hours per day with only short breaks when my left hand began to hurt.
- I continued to play in pain thinking it would resolve subscribing to the idea “no pain, no gain.”
- Eventually, the chronic daily pain forced me to quit playing the fiddle and guitar for 2 years.
- I was studying mechanical engineering at ASU at the time of the injury and had to learn to write with my right hand due to pain in the left with handwriting and keyboard use.
- 14 different physician specialists (all M.D.’s) were involved in my care and treatment over a two year period with no relief or improvement.
- Needless to say I was frustrated with the pain and what I perceived as their lack of knowledge of my problem as a musician.
- And then I was introduced to an osteopathic physician...



# Carlisle Holland, D.O.

- Practicing in Phoenix at the time, he successfully treated the somatic dysfunction of my neck, thoracic, and upper extremity by performing several osteopathic manipulative treatments over the course of a couple months using a combination of counterstrain, myofascial release, muscle energy, cranial, and HVLA.



# The result of Dr. Holland's treatment went beyond an improved patient...

- Impressed with Dr. Holland's previous education in mechanical engineering, his biomechanical medical knowledge, his osteopathic manipulative skills that were completely unfamiliar to me, and his ability to treat the cause of the problem, not just the symptoms, I said....
- **SIGN ME UP!** How to I learn to do what you can do so I can help others with similar problems?

# Categories of Problems

- Performance related or caused problems
  - Musculoskeletal problems
  - Non-musculoskeletal problems
- Performance affecting problems, but not performance related
  - Musculoskeletal problems
  - Non-musculoskeletal problems

# Performance Related or Caused Problems

## Musculoskeletal Problems

- Overuse syndromes
  - Tendinitis
  - Tenosynovitis
  - Muscular strains
  - Ligamentous sprains
  - Bursitis
  - Somatic dysfunction
- Nerve Entrapments
  - Carpal tunnel syndrome (CTS)
  - Ulnar nerve entrapment
  - Thoracic outlet syndrome (TOS)
- Focal dystonia
- TMJ dysfunction

# (Repetitive) Overuse Syndrome

- Overuse occurs when the tissues are taken beyond their biological tolerance resulting in pain or weakness.
- Acute overuse results from micro-tears in the muscle caused by the contractile actions of the muscles themselves.
- Responds well to osteopathic manipulation, although PT, massage, anti-inflammatories, and rest are helpful as well.

# Factors Leading to Overuse

- Genetics: Some performing artists are more vulnerable to overuse than others, especially those with medical problems associated with connective tissue disease or joint laxity. Females are more prone to injury as well.
- Technique: Playing should be tension free where wasteful uncontrolled or excessive muscular effort is avoided. Efficiency is important.
- Practice habits: Muscles are more prone to injury if not warmed-up prior to playing. Continuous uninterrupted playing fatigues muscles and increases risk of overuse. A sudden increase in playing time is hazardous.
- Duration and intensity: The duration and intensity of practice seems to be the most important factor and the most controllable factor by the performer.
- Conditioning of musician: Often musicians have weak or inhibited upper back muscles.

# Prevention of Overuse Syndrome

- Education: Education of students and teachers on the nature of overuse syndrome so basic information for self-preservation is practiced.
- Safe, sensible, and disciplined practice habits must be encouraged. Frequent breaks every 30 minutes or so allow muscles to rest and become more responsive after the break. Continuous practice without breaks reduces response as the muscles become progressively more fatigued.
- Muscular activity used to hold up heavy instruments competes directly with skilled muscle activity of performance and should be eliminated where possible.
- Muscle strengthening and flexibility exercises reduce the potential for injuries.
- Do not continue to play if there is pain.

# Nerve Entrapments

- Carpal tunnel syndrome
- Ulnar nerve entrapment
- Thoracic outlet syndrome



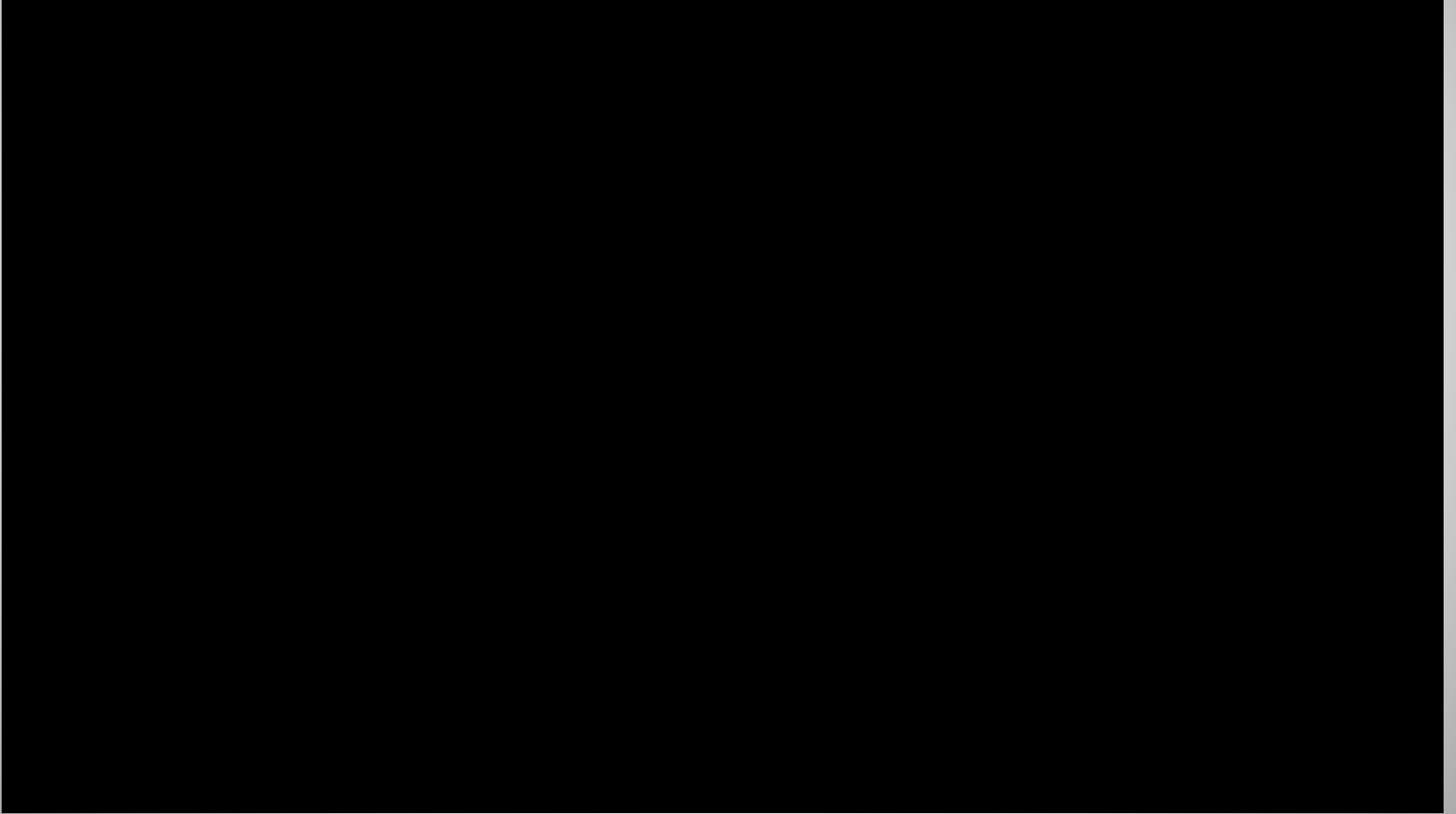
# Nerve Entrapments

- Nerves in the upper extremity may become pinched anywhere along their course from the neck to the fingers. In some cases they can be pinched in more than one location (i.e. double crush phenomenon). This can cause pain, numbness, tingling, weakness, and/or swelling.
- Forward posturing of musicians with their instruments in front of them can lead to somatic dysfunctions which can cause nerve entrapments.
- Responds well to osteopathic manipulation if not too severe.

# Focal Dystonia

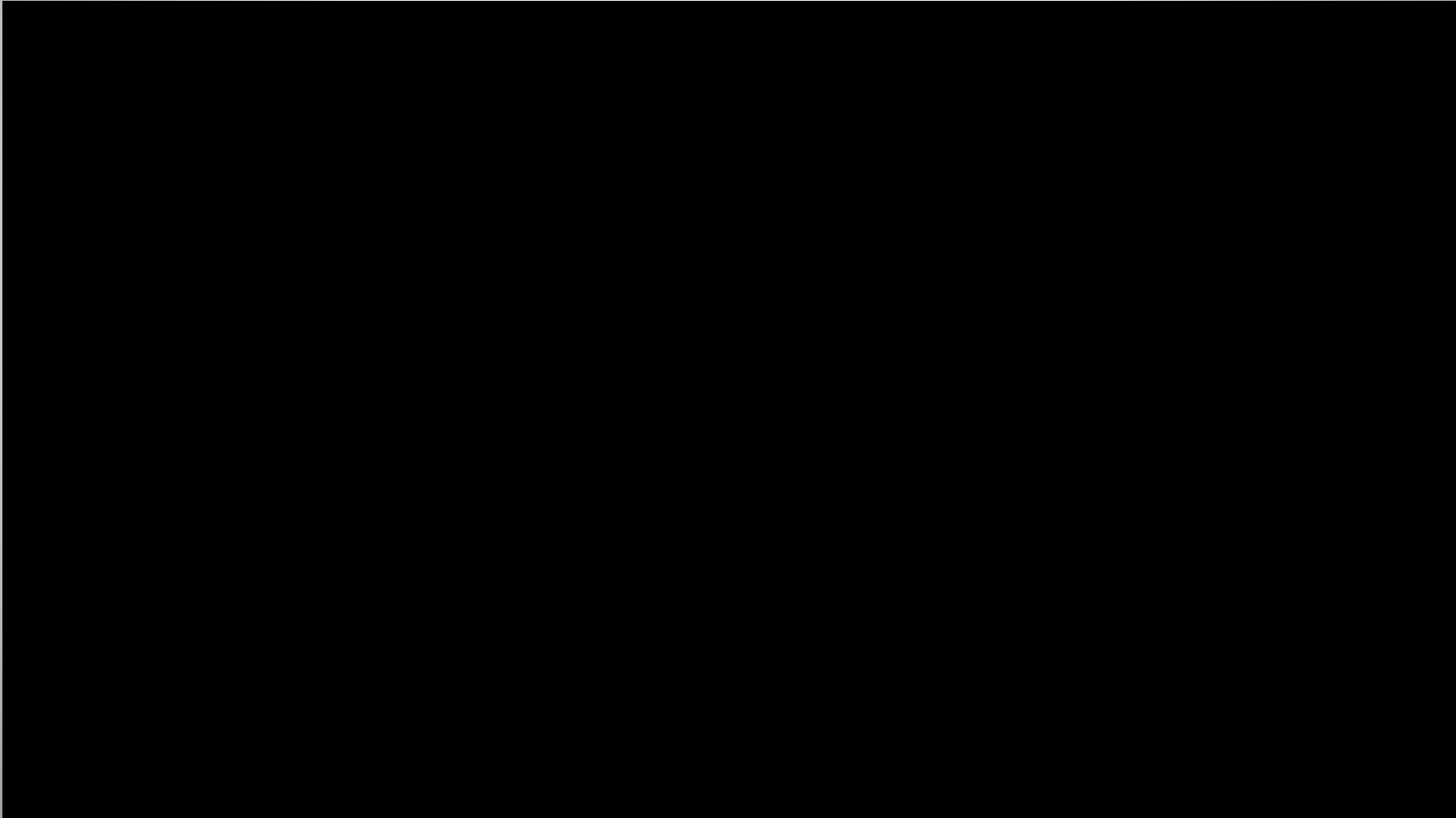
- Focal dystonia is usually a painless syndrome of sustained muscle contractions of both agonist and antagonist muscle groups causing repetitive, involuntary movements or abnormal postures.
- It can be devastating often occurring at the height of a musician's career. It is difficult to successfully treat.
- May attempt treatment with Botox, PT/OT, and osteopathic manipulation, but it responds best to modification of technique by slight repositioning to engage different muscle groups or fibers.
- Most commonly involves
  - Writer's cramp with loss of hand control/dexterity
  - Loss of lip (embouchure)

# Focal Dystonia in the Right Hand of a Pianist Improves Her Control by Slightly Changing Her Technique and Positioning



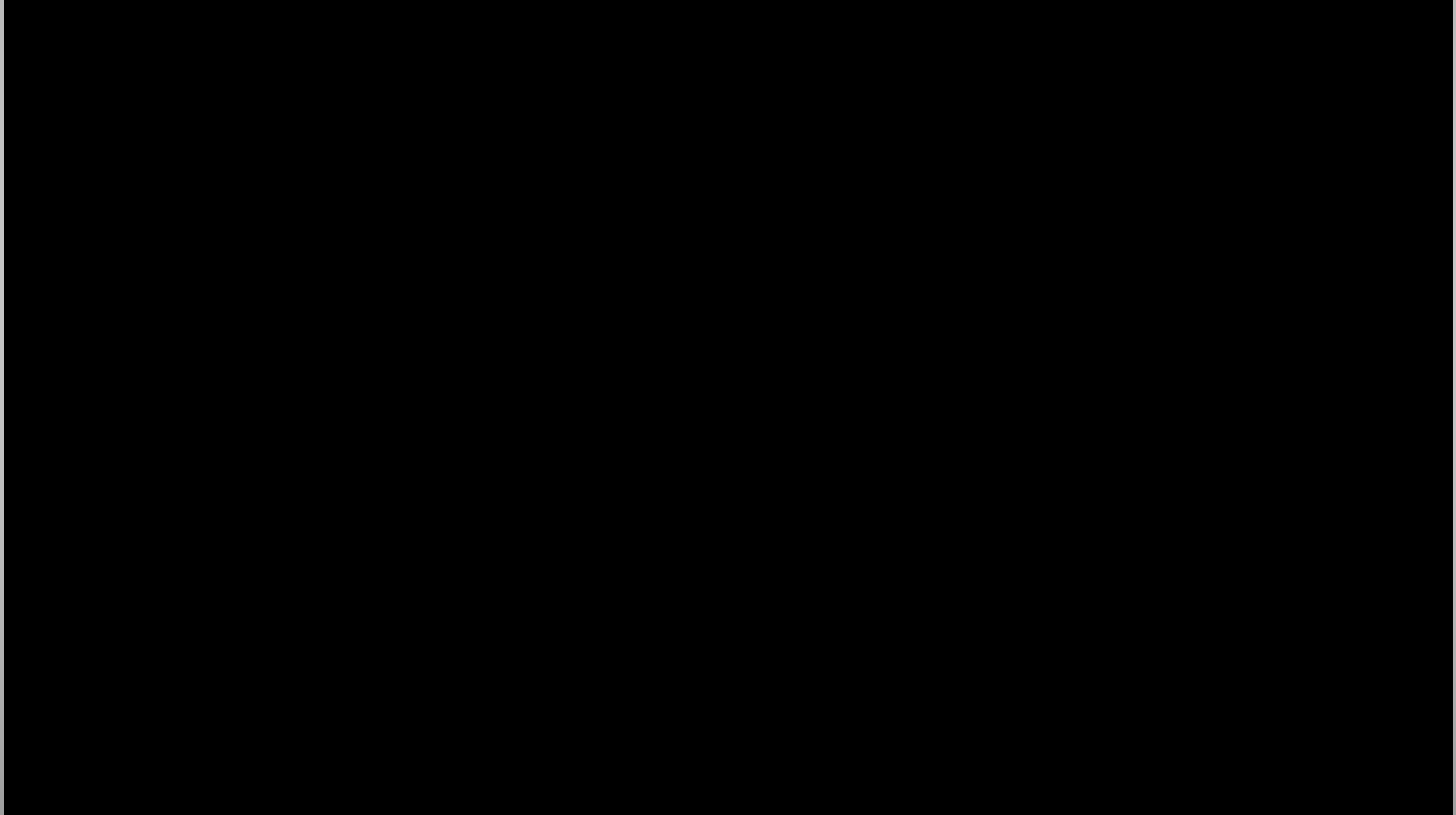
# Focal Dystonia

Guitarist Billy McLaughlin with Left Hand 4<sup>th</sup>/5<sup>th</sup> Digit  
Loss of Coordination Learns to Play in a Different Way



# Flamenco Guitarist

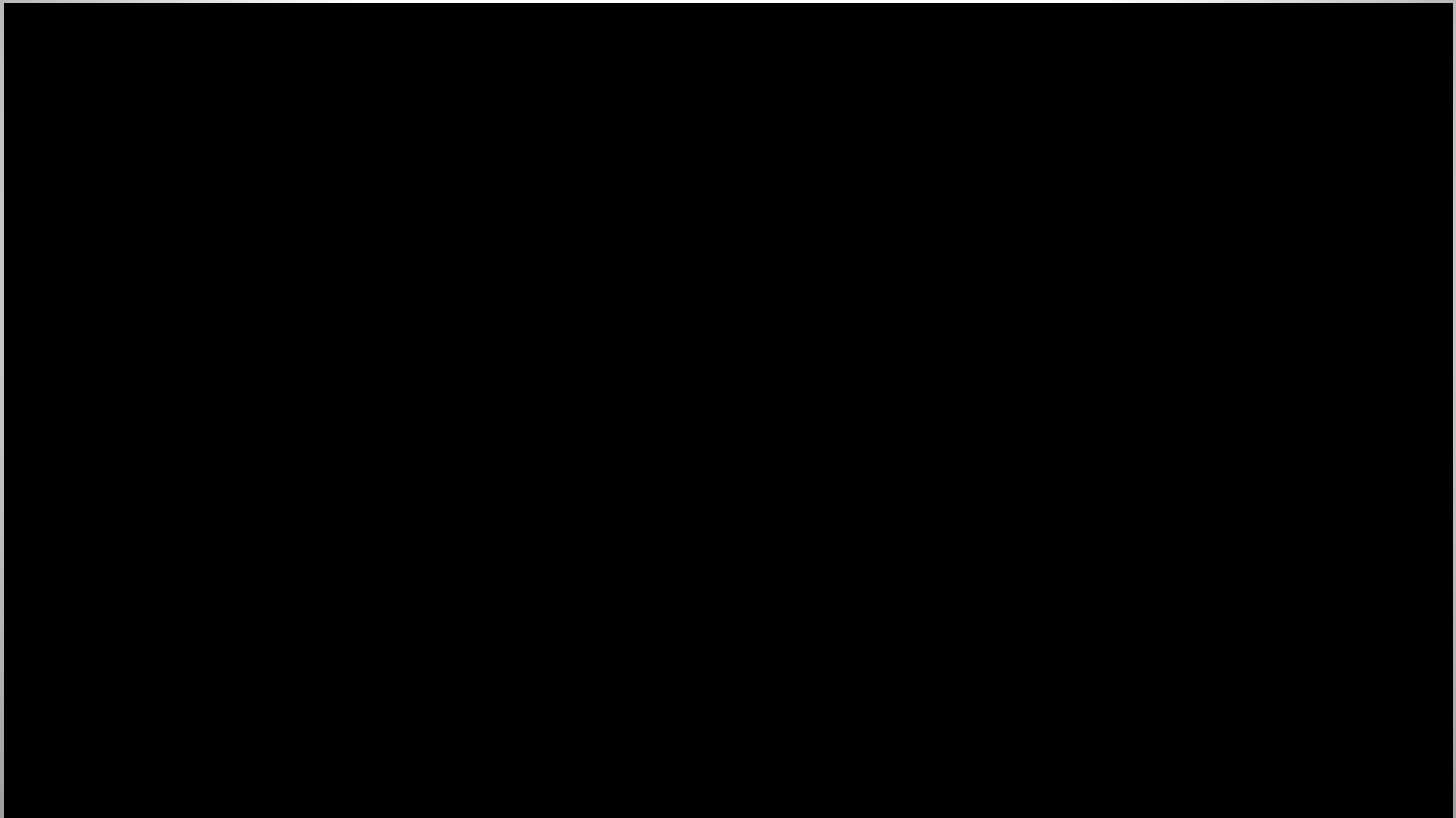
Improved Following Neuromuscular Retraining



# Drummer with Right Hand Focal Dystonia

Improved Simply by Changing Muscle Groups Used

(watch from 2:20)



# TMJ Dysfunction

- Temporal mandibular joint pain is most common in violin players. An uneven stress is placed upon the joints by holding the violin under the chin. It is best treated and prevented using a center placed chin rest. Modification of technique also offers good results.
- Osteopathic manipulation is directed at treating the muscular strains of the TMJ.



# Performance Related or Caused Problems

## Non-Musculoskeletal Problems

- Performance anxiety (stage fright)
- Dermatologic problems
  - Allergies to woods, varnishes, or metals
  - Skin friction problems
- High pressure problems (of playing brass instruments)
  - Subconjunctival hemorrhage
  - Hemorrhoids

# Performance Anxiety

- Definition: Nervousness before or during an appearance before an audience which affects a musician's ability to perform.
- ICSOM study: 17% of 2122 symphony members mentioned stage fright as a SEVERE problem, while 50% are negatively affected by performance anxiety.
- 40% of musicians with severe stage fright use beta-blockers, 27% of all musicians use beta-blockers
- Shoup: 55% of high school and junior high school musicians suffer negative effects from performance anxiety.

# Performance Anxiety Symptoms

- Severe nervousness
- Shakiness
- Dry mouth
- Increased heart rate
- Perspiration
- Cold hands
- Breathing difficulties



# Performance Anxiety Treatments

- Meditation
- Deep breathing
- OMT
  - Diaphragm
  - Sympathetic or autonomic treatments
  - Cranial
- Beta-blockers
  - Decreases symptoms associated with performance anxiety: Tremor, increased heart rate, hyperventilation, perspiration.
  - May cause counterproductive side-effects such as dry mouth, decreased mental clarity, etc. Dry mouth could be problematic in vocal, woodwind, and brass instruments.
  - Propranolol 10 mg about 30 minutes prior to performance is useful to control sympathetic response.

# Dermatologic Problems



- Fiddler's Neck
  - Caused by friction, pressure, perspiration, and force required to hold the instrument, or allergy to chin rest wood.
  - 62% of a study of 523 professional violin and viola players had a “practice mark” - Blum
  - High rates of successful treatment were seen in chin rest padding and centrally placed chin rests.
  - Pharmacologic treatment consists of topical cortisone preparations to reduce dermatitis.

# Performance Affecting Problems That Are Not Performance Related

- Musculoskeletal problems
- Non-musculoskeletal problems

# Musculoskeletal

- Osteoarthritis (DJD/DDD)
- Autoimmune disorders causing joint or muscle problems
- Headaches
- Fractures and muscular strains/sprains
- Chronic or acute somatic dysfunctions
- Neuropathies (drug induced, nerve compressions, etc.)
  
- Many potential others



# Non-musculoskeletal

- Asthma or allergies – may cause problems with woodwind/brass/vocal playing.
- Diabetic neuropathy – numbness of hands may cause problems with playing
- Loss of vision, hearing, or memory
- Cold sores
- Hemorrhoids
- Depression
- Pharyngitis
- Neurologic disorder such as Parkinson's, multiple sclerosis, Bell's palsy
- Many potential others

# Focus on Musculoskeletal Performance Related Problems

- Osteopathic manipulation has the greatest impact on these problems
- More in depth look at the following
  - Epidemiology
  - Related somatic dysfunctions
  - Treatments
  - Prevention

# Epidemiology of Musculoskeletal Performance Related Problems

- Incidence
- Age
- Gender
- Location
- Instrument

# Incidence of Performance Related Medical Problems in Professional Musicians

- Fry: 64% of 485 symphony orchestra musicians reported a painful overuse syndrome
- Fishbein: 72% of 2212 ICSOM members reported a severe problem
- Lederman: 50-60% of professional string and keyboard instrumentalists have had a upper extremity disorder
- These numbers report the incidence of a problem up until this point in a musicians career. The prevalence would be much lower.

# Incidence of Injuries in University and Secondary School Musicians

- Fry: 20% of 658 musicians between the ages of 10 and 20 suffered overuse
- Lockwood: 32% of 113 high-level secondary school musicians had mild problems, and an additional 17% had severe problems
- Shoup: 33% of 425 high school and junior high school musicians reported a musculoskeletal problem related to playing. Medical Problems of Performing Artists, 1995.

# Age

- Average age is about 32
- The greatest prevalence occurs in musicians who play the most
  - i.e. college performance majors, young professional musicians

# Gender

- Musculoskeletal performance related problems occur in women almost twice as much as men (1.7:1).
  - Smaller anatomy
  - Less muscle mass
  - Women often more willing to seek medical attention



# Location

- Is instrument specific
- The most common areas of involvement:
  - Hands and fingers
  - Elbows
  - Shoulders
  - Neck
  - Upper back
  - Lower back

# Musical Instrument Specific Problems



# Violin and Viola

- In an orchestral setting, these musicians play almost continuously. Muscular overuse, both from static loading and repetitive activity, occurs frequently. Painful overuse injury of the hand and wrist is common in the bowing hand, but even more so in the fingering hand. Right shoulder problems such as bursitis may occur from vigorous bowing. Aching and muscle fatigue in the neck and shoulder is common.

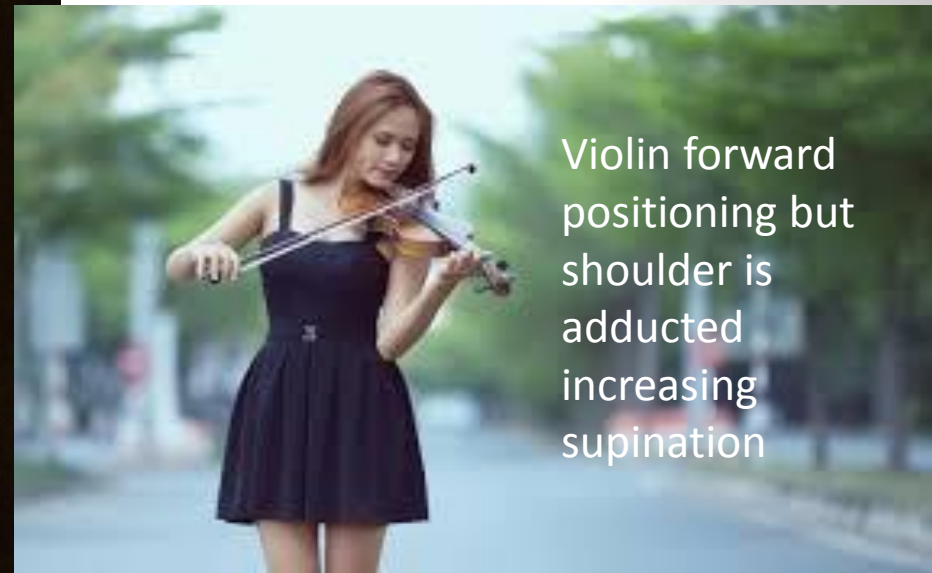
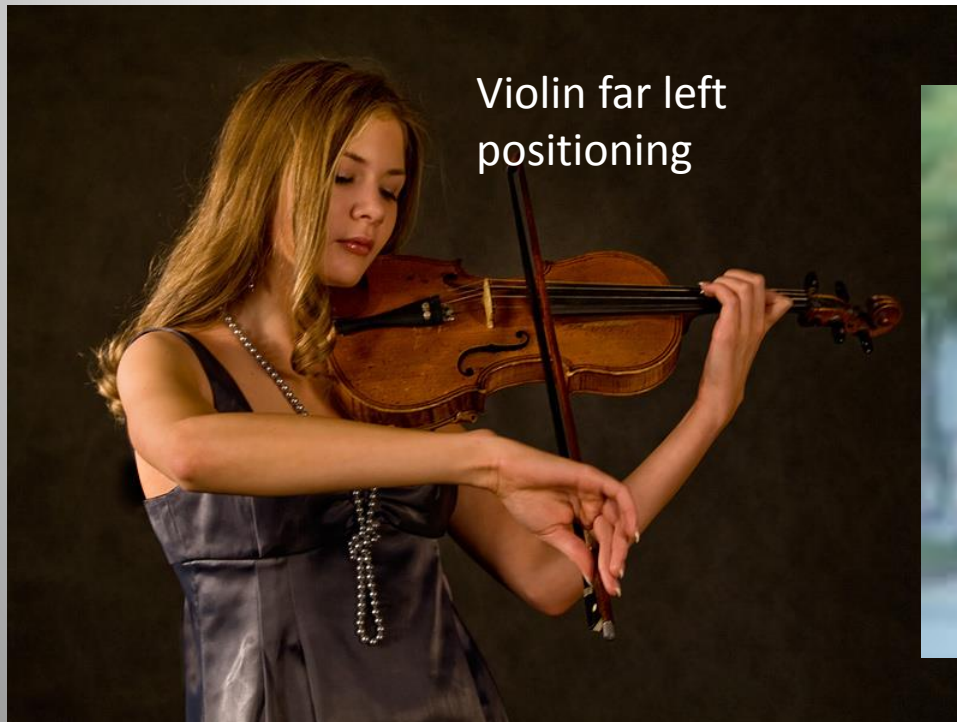


# Violin and Viola (continued)

- There is an association of premature development of degenerative cervical spine disease with long hours of holding the violin between the chin and left shoulder. The spine undergoes prolonged uneven loading in a relatively fixed position.

# Analysis of Stresses with the Following Violinist's Position

Photo on the left shows violin position being far off to the violinist's left side which increases the supination of the left forearm and increases the forward flexion of the right arm (bowing arm). This playing position, while common, can increase left hand and forearm overuse as well as right shoulder problems such as bursitis.



# Other Interesting Playing Positions

Chin is far to the right side of the violin, completely off the chinrest. This will lead to fiddler's neck.



Left elbow and forearm is to the far right of the instrument increasing the supination of the forearm and increasing stress to the forearm and hand.





# Solving the Previous Problems

By bringing the violin more in front of the violinist, you decrease the strain on the left forearm and right shoulder. Also, the elbow is kept below the instrument.





# Fiddle Demo

- Osteopathic Violin Manipulation

# Cello

Yo-Yo Ma

- Cellists frequently report lumbar pain associated with long periods of sitting with restricted movement. Cellists are subject to the same upper limb overuse as violinists and violists, although there is no static loading of the fingering hand and no supination of the forearm, so the incidence of overuse is generally less. However, more muscle strength is required to finger the instrument which can lead to strains.



# Bass

Edgar Meyer

- The bass takes a great deal of strength to play due to the force required to press the strings against the fingerboard.
- Surprisingly, overuse of the upper extremities is less frequent than with other strings.
- Low back pain from prolonged static positioning and carrying the heavy instrument is the most common ailment.



# Guitar/Mandolin

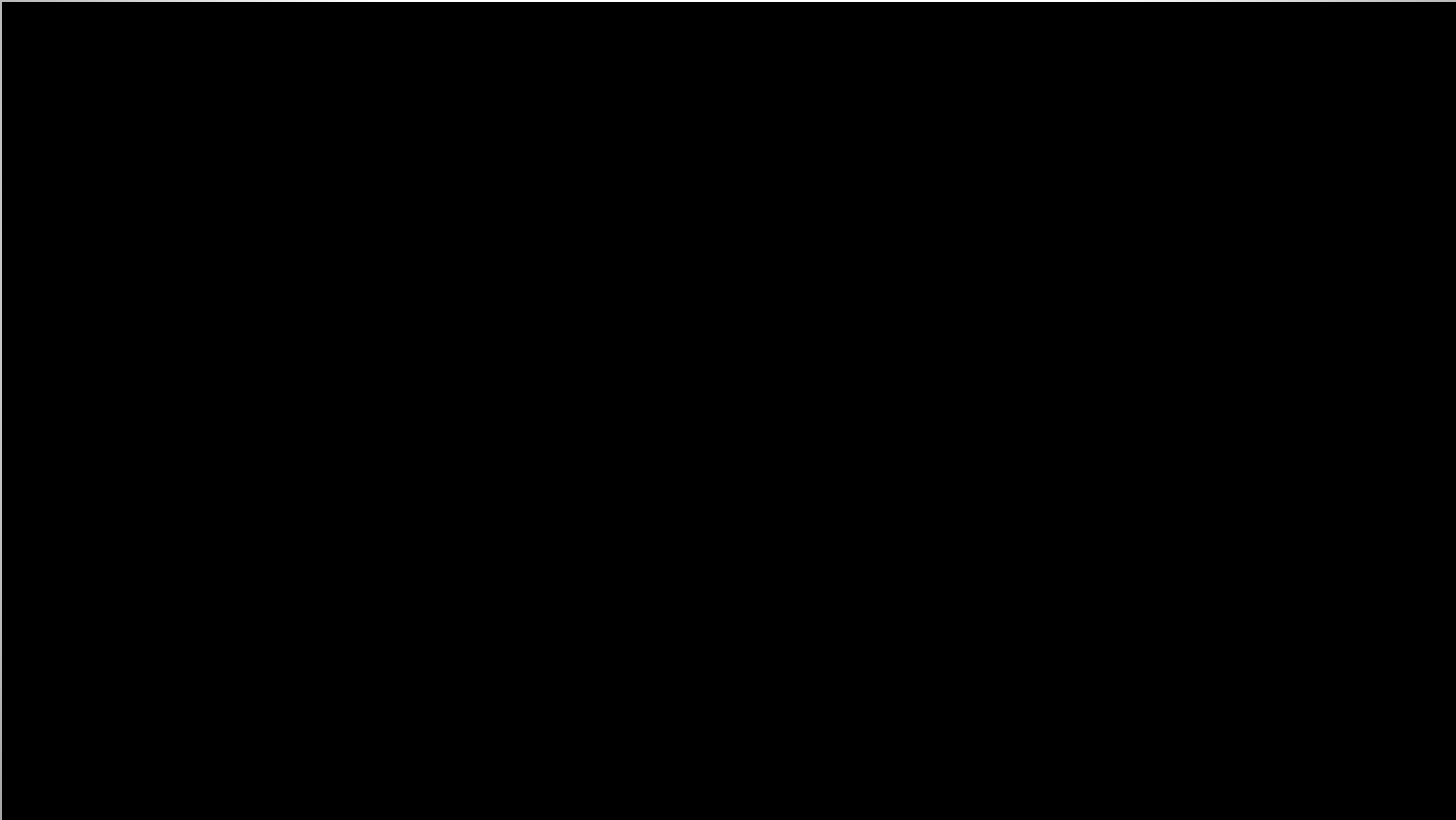
- The unnatural position of the left hand in a supinated and flexed position while fingering the guitar or mandolin predisposes to overuse injuries

Chris Thile



# Edgar Meyer/Chris Thile

## Bass and Guitar





# Clarinet and Oboe

- Static loading of the weight of the instrument placed on the right thumb accounts for muscular strain in the thumb adductor muscles and chronic loading at the 1<sup>st</sup> MCP, PIP, and DIP can lead to early arthritic changes.



# Saxophone

The Saxophone is ergonomically one of the best instruments, with one of the least incidence of performance related problems. The static load of the instrument is well supported by the harness. The forearms and hands are in near neutral positions.



# Harness for Static Load Support of Clarinet, Saxophone, and Oboe



This style of harness is the most desirable because it does not place a static weight entirely around the neck.



# Coband Tape

- Helps supports sprained/strained ligaments/muscles by restricting joint motion and supporting the joint.
- Useful in the right thumb strains of clarinet and oboe players.
- Useful in right thumb strains of string players caused by excessive bow pressure.



# Flute

- The right shoulder is highly abducted during performance which can cause strain of the Deltoid or rotator cuff muscles. It could also lead to shoulder bursitis.
- Left hand overuse occurs to the index finger because of the unnatural extended positioning.



# Brass

- The static loading caused by the weight of the heavier instruments can lead to muscle strains.
- Overall there is a lower incidence of overuse of the hand than with string instruments
- High pressures are required to produce sound which may results in hernias, intraocular bleeds, hemorrhoids, and blackouts.

Dizzy Gillespie



# Keyboard/Piano

- Keyboardists pronate their forearms while deviating their wrists from side to side. The unnatural position decreases efficiency and increases stress to the muscles and joints.
- The Latissimus Dorsi muscle is important for controlling the weight of the arm, thus affecting dynamic control. Check for hypertonicity of this muscle.
- Heavy key action of the instrument or forceful playing can compound the stresses.





# Harp

- Perhaps the least user-friendly instrument played, the harp can result in overuse of the upper extremities, even from tuning it, which requires a repetitive effort. The weight makes transporting it hazardous. Plucking the strings places a great deal of stress on both hands.



# Drums

- Drumming involves high speed repetitive use of both upper extremities and both lower extremities. This leads to possible overuse problems most commonly involving the shoulders, elbows, and wrists.



# There are Many Other Musical Instruments, So I May Have Left a Few Out

- We are not discussing the bag pipes (Sorry Dr. Feely) or banjo (because I don't like the banjo).
- What's the difference between an anchor and a banjo?
  - You tie a rope to the anchor before you throw it overboard!





# Musician History, Physical, and Structural Examination

- Musicians often present to the office with musculoskeletal complaints that are non-performance related but affect their playing or other hobbies.





# Occupation History for the Musician

- Pertinent details include
  - Hours spent playing per day and per week average
  - Intensity of playing per day
  - Other hobbies or interests which may contribute to overuse of the involved region (computer, texting, repetitive tasks)
  - Occupational (music or otherwise) extremity usage
  - Frequency of breaks or rest periods
  - Frequency of cardiovascular or stretching exercise

# Structural Examination

- A routine osteopathic examination is performed.
- Special attention is focused on instrument specific problem areas.
- The physician observes and palpates for areas of tension while the musician is playing. Inappropriate areas of tension will be obvious to the osteopathic physician even without full knowledge of proper instrument technique.

# Uneven Strains of Playing an Instrument

- Instruments are typically played in an asymmetric position with one arm in one position and the other in different position, which could lead to strains.
- Instruments are typically played in front of the musician which creates a tendency to lean forward into the instrument.

# Somatic Dysfunction Caused by Forward Posturing During Instrument Playing

- Forward posturing leads to
  - Internally rotated Humerus
  - Protracted Scapula
  - Sternoclavicular joint friction
  - Elevation of shoulders, Anterior/Middle Scalene contraction
  - 1<sup>st</sup> rib elevation
  - Pectoralis Minor contraction

# Common Somatic Dysfunctions

- Greenman Upper Quarter Syndrome Findings
  - Hypertonic upper Trapezius, SCM, and Levator Scapula Muscles
  - Inhibited/weak Rhomboids, lower Trapezius, and Serratus Anterior Muscles
  - Inhibited/weak forearm extensors, hypertonic forearm flexors
  - Strong hand grip strength, but weak hand extensors

# Common Counterstrain Tenderpoints

(Often Correlated to Greenman's Hypertonic Muscles)

- Supraspinatus
- Subdeltoid Bursa
- Levator Scapula
- Trapezius
- Supinator
- Lateral Epicondyle
- Adductor Pollicis (1<sup>st</sup> CMC) and 1<sup>st</sup> MCP
- Dorsal Interossei

# Osteopathic Manipulative Techniques

- Treatments of many of the common somatic dysfunctions and overuse injuries that musicians experience will be covered in lab.
- Goal: to remove impediment to motion in the fascia, muscle, joints, and other soft tissue and restore normal motion.

# Primary Treatment of Acute Performance Related Musculoskeletal Problems

- RICE
  - Rest
  - Ice
  - Compression
  - Elevation
- NSAIDS (Voltaren gel is good for localized pain)
- Splints
- OMT
- Stop playing! No playing allowed until it can be done without causing pain.



# Treatments for Chronic Problems

- Rest
- Heat/Ice
- Physical/Occupational therapy
- Massage therapy
- Strengthening/stretching exercises
- Osteopathic manipulation (OMT)
- Chiropractic manipulation
- Medication
- Acupuncture
- Modification of lifestyle and performance technique

# Treatments for Chronic Problems

- Relaxation/Postural techniques
  - Biofeedback
  - Meditation
  - Yoga
  - Alexander technique
  - Feldenkrais
- Splints
- Surgery
- Supplements
- Aerobic conditioning

# Medications/Injections

- NSAIDS
  - Oral or topical (Voltaren gel)
- Muscle relaxants
- Steroid Oral or Injectable
- Trigger point injections (caution with steroid use due to possible muscle/tissue damage which could effect fine muscle control)
- Prolotherapy
- Botox

# Supplements

- Tendon and soft tissue support
  - Vitamins/minerals (C, E, B<sub>6</sub>, A, Zinc, Magnesium)
  - Turmeric
- Anti-inflammatory support
  - MSN (Methylsulfonylmethane)
  - Arnica Montana (Traumeel cream)
  - Enzymes (Wobenzyme, Bromelain, Papain)

# Prevention and Education

- It is critically important that musicians and other performing artists perform in the safest possible manner. In recognition of this, the Health Promotion in Schools of Music (HPSM, 2004) created an education and awareness agenda for all educational institutions. This was adopted by the National Association of Schools of Music (NASM) which now recommends that all university music schools provide educational coursework on performance health and safety, including performance related medical problems. (Devroop and Chesky)

# Prevention

- Warm-up
  - Warm water
  - Stretching exercises (patient handout)
  - Scales and slow playing, singing, or dancing
- Cool-downs
  - Ice massage
  - Stretching exercises (patient handout)

# Prevention

- Aerobic physical conditioning/endurance training
- Strengthening exercises
- Breaks during practice sessions
- Avoidance of sudden increase in playing time
- Prophylactic NSAIDS therapy when appropriate
- Elimination of excessive stresses while playing

# References

- Textbook of Performing Arts Medicine 3<sup>rd</sup> Edition
- Journal of Medical Problems of the Performing Artists
- <http://www.healthyperformers.com/video/>

