



## Basic Orientation on Musculoskeletal Disorders

### Handout for Musicians

#### Introduction

Ergonomics is the science of fitting the workplace conditions and job demands to the worker. This information is intended to provide musicians and supervisors with a minimum basic understanding of ergonomics and instrumental injuries.

Instrumental injuries often include the same conditions experienced from computer overuse: Carpal Tunnel Syndrome, Tendinitis, Bursitis, Tenosynovitis / DeQuervain's Syndrome, Tendinosis, Thoracic Outlet Syndrome, Myofascial Pain Syndrome, Cubital Tunnel Syndrome, and Trigger Finger/Thumb are particularly common among keyboardists, fretboardists, flute, and string players.

Incorrect posture, non-ergonomic technique, excessive force, overuse, stress, and insufficient rest contribute to chronic injuries that can cause great pain, possible injury or disability, and the end of careers.

#### Purpose of an Ergonomics | Conservation Program

The purpose of the University's Ergonomics Program is to identify and reduce working conditions that can cause musculoskeletal disorders. Ergonomic injuries are known as work-related musculoskeletal disorders.

#### Risk Factors

Students, workers and their supervisors should be aware of conditions that can cause physical stress to the musculoskeletal system. These include:

Risk Factor	Movement Examples (in constant or excessive patterns)
Awkward Posture	Twisting, bending or reaching
Forceful Exertions	Squeezing, pinching, pulling, pushing, or lifting
Repetitive Motions	Motions repeated frequently over time coupled with one or more other risk factors.
Static Loading	Holding body posture without movement for extended periods of time.

## Injuries

Back disorders and cumulative trauma disorders (CTD) are the two most common injuries. Back disorders are often pulled or strained muscles, ligaments, tendons and disks. They can be caused by lifting or carrying loads that are too great, twisting, or remaining in an awkward posture for extended periods of time. Symptoms may include backaches and the inability to lift or maneuver.

Cumulative trauma disorders can affect the upper and lower arms, elbows, wrists, hands and fingers, shoulders and neck, lower limbs, and back. They are associated with repetitive motion activity over a period of time coupled with awkward posture or force, for example. Symptoms may include numbness or a tingling sensation in the fingers, palms or other body locations. Other symptoms include soreness or pain and difficulty moving fingers, shoulders, elbows, wrists or backs.

## Prevention

Ergonomic risk factors can be minimized or eliminated by incorporating proper body mechanics, neutral postures, and prevention strategies as following:

- **INFORM YOURSELF.** Causes and prevention are a complex topic refer to this reference guide and resources such as Northwestern University music consultation program
- **EVALUATE YOUR TECHNIQUE.** 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.
- **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.
- **PERFORM MICROBREAKS.** This means both momentary breaks every 20 minutes for 5-10 seconds and longer breaks every hour for 1-2 minutes. 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. 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.
- **PACE YOURSELF.** It is very common for musicians to notice injury when preparing for recitals or concerts, attending music camps or heavily involved in multiple musical groups. These three areas can radically increase your playing time and exceed the limits of our body. This applies to even students, who feel invincible. Learn to pace yourself.
- **GET MEDICAL HELP.** From your private insurance you may consider seeing occupational therapy, physical therapy or your doctor. 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. "No Pain, No Gain" is a disastrous policy for a musician.

- **EVALUATE OTHER ACTIVITIES.** Your problems may be caused or aggravated by other things you do frequently. Look at your computer use and assess your body positioning, effort and tension while performing your keying and mousing tasks.
- **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 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?
- **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 activities may make it worse.

## Glossary

### ***Assessment –***

A comprehensive ergonomic assessment benefits the worker by improving efficiencies and comfort while maximizing safety at a justifiable cost. Increased productivity and reduced employee downtime deliver an excellent ROI. Our ergonomic assessments apply methodologies for analyzing, designing, and evaluating systems. We address basic to complex problems by identifying and correcting inefficiencies and introducing mitigation techniques and tools to create a workplace that fits the employee.

### ***Back Disorders -***

Back disorders are often pulled or strained muscles, ligaments, tendons and disks that can be caused by lifting or carrying loads that are too great, twisting, or remaining in an awkward posture for extended periods of time. Symptoms may include backaches and the inability to lift or maneuver.

### ***Cumulative Trauma Disorders -***

Cumulative trauma disorders can affect the upper and lower arms, elbows, wrists, hands and fingers, shoulders and neck lower limbs, and back. They are associated with repetitive motion activity over a period of time coupled with awkward posture or force, for example. Symptoms may include numbness or a tingling sensation in the fingers, palms or other body locations. Soreness or pain may also be present. Difficulty in moving fingers, shoulders, elbows, wrists or back may accompany these symptoms.

## ***Ergonomics -***

Ergonomics is a science and process that examines how an individual interfaces with the work environment. There are many specialties in Ergonomics. The focus in occupational health is to identify and reduce risk factors associated with musculoskeletal disorders.

## ***Ergonomics Injury –***

For the purpose within occupational health, an ergonomics injury refers to a musculoskeletal disorder.

## ***Musculoskeletal Disorders (MSDs)-***

Repeating a particular motion constantly, whether it's using a computer mouse or shoveling dirt, may cause damage to tendons, muscles, and joints. The injury can be a combination of an inflammation in a joint or tendon and damage to body tissues.

## ***MSDs- What are they?***

According to OSHA (Occupational Safety and Health Administration), MSDs are defined as a group of illnesses associated with ongoing damage to soft tissues. Problems such as these may also be called:

- Repetitive motion injuries (RMIs)
- Repetitive strain injuries (RSIs)
- Cumulative trauma disorders (CTDs)

## ***MSDs- Why You Should Care?***

If you don't pay attention to ergonomics, the activities you do may, over time, lead to a musculoskeletal disorder. This group of physical problems usually affects soft tissues (muscles, tendons, and nerves) and joints. Although MSDs most frequently affect the back and wrists, your whole body is actually at risk. MSDs can damage fingers, elbows, and shoulders, as well as the neck and arms, and even the legs. Left untreated, an MSD may limit your range of motion or reduce your ability to grip objects.

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## **Common MSDs Definitions:**

**Bursitis-** inflammation of a bursa, typically one in the knee, elbow or shoulder

**Carpal Tunnel Syndrome-** a painful condition of the hand and fingers caused by compression of a major nerve where it passes over the carpal bones through a passage at the front of the wrist, alongside the flexor tendons of the hand. It may be caused by repetitive movements over a long period, or by fluid retention, and is characterized by sensations of tingling, numbness, or burning.

**Cubital Tunnel Syndrome**- referred by most medical practitioners as ulnar nerve entrapment. The condition is brought by the increase pressure on the ulnar nerve (nerve that is situated alongside the ulna bone). The path along the cubital tunnel is obstructed, thus causing the syndrome. The compression can lead to the sensations of pins or needles in a person's fingers. The condition was firstly identified and used in medical term by Feindel and Stratford in the year 1958. They presented that the condition is caused by the ulnar nerve compression.

**DeQuervain's Syndrome**- painful inflammation of tendons in the thumb that extend to the wrist. The swollen tendons and their coverings rub against the narrow tunnel through which they pass. That causes pain at the base of the thumb and into the lower arm.

**Myofascial Pain Syndrome**- pressure on sensitive points in your muscles (trigger points) causes pain in seemingly unrelated parts of your body. This is called referred pain.

**Neuropathies**- "Neuropathy" is a general medical term that refers to diseases or malfunctions of the nerves. Neuropathies are classified by the types or locations of the nerves they affect. Focal neuropathies are those focused on one nerve or group of nerves within a particular area of the body. Symptoms usually appear suddenly and can include pain; sensory disturbances, such as numbness, tingling, "pins of needles" sensations, burning, or even itching; and weakness. In the case of bodily extremities, the pain may occur at the site of a nerve compression or entrapment.

**Tendinitis**- inflammation of a tendon, most commonly from overuse but also from infection or rheumatic disease.

**Tenosynovitis**- inflammation and swelling of a tendon, typically in the wrist, often caused by repetitive movements such as typing.

**Thoracic Outlet Syndrome (TOS)**- is a condition where the superior thoracic outlet is compressed resulting in compression in the middle scalene and anterior scalene of a neurovascular bundle (consists of the C8 and T1 nerves plus the brachial plexus and subclavian vein and artery).

**Trigger finger (or thumb)**- a defect in a tendon causing a finger to jerk or snap straight when the hand is extended

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### ***Recognizing the Symptoms***

Early detection of Musculoskeletal Disorder symptoms helps prevent the onset. Symptoms associated with repetitive exposure to computer usage and excessive material handling. Other ergonomic risk factors may include low back pain or pain in the thumb, finger, wrist, forearm, elbow, neck, and shoulder. Other early warning signs include burning, cramping, numbness, swelling, tingling, weakness, fatigue or pain.

If you feel pain, or notice such signs or symptoms, do not ignore them or let them go unnoticed, no matter how minor they are--you may be at risk of developing a work-related MSD. Take immediate action: assess your work habits, look for the causes of your symptoms, and take necessary preventive measures.

### ***Avoiding Problems at Work, School and Home***

Using ergonomic principles on the job reduces your risk of developing a work-related MSD. By acting now, you may save yourself months of future discomfort and possible time away from work. And don't think of ergonomics only at work. Apply ergonomic principles to everything you do and treat your body right 24 hours a day.

### ***Risk Factor(s) –***

Risk factors are conditions that can cause physical stress to the musculoskeletal system. They may be inherent in the individual or related to activities performed. Examples of risk factors are awkward posture, forceful exertions, repetitive motions, contact stress, vibration, and static loading.

#### **UW Madison University Health Services (UHS) Resource Links:**

Occupational Health: <http://www.uhs.wisc.edu/occ-health/index.shtml>

Occupational Medicine: <http://www.uhs.wisc.edu/occ-medicine/index.shtml>

Ergonomics: <http://www.uhs.wisc.edu/occ-health/ergonomics/index.shtml>

#### **Additional Musicians Resource Links:**

<http://ergonomics.about.com/od/music/a/ergomusicians.htm>

<http://www.gizmag.com/ergonomic-musician-chair-developed/22948/>

<http://musiciansway.com/wellness.shtml>

<http://www.musicianshealth.co.uk/musiciansmusculoskeletaldisorders.pdf>

<http://www.musicianshealth.co.uk/exerciseformusicians.pdf>

<http://www.uwhealth.org/performing-arts-medicine>