



# **Musician Health:**

## A Primer and Resource Guide

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**This educational booklet is produced by the National Network of Libraries of Medicine South Central Region (NNLM SCR) in partnership with the Texas Center for Performing Arts Health (TCPAH).**

<https://tcpah.unt.edu/>

**For references to all 28 numbered in-text citations and links to resources in this publication:**

<https://nnlm.gov/scr/initiatives/performingartshealth>

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**IMPORTANT NOTE: The information in this booklet is not medical advice.**

## Musculoskeletal Health

Musculoskeletal issues in musicians are commonly referred to as **Playing-Related Musculoskeletal Disorders**, or **PRMDs**.

They can be described as “pain, weakness, numbness, tingling, or other symptoms that interfere with ability to play instrument at the level [the musician] is accustomed to.”<sup>1</sup>

### Who do they effect?

PRMDs can affect musicians of any age and skill level. Studies have consistently found that while PRMDs affect both men and women, women musicians are more likely to encounter PRMDs than men.<sup>2</sup>

### Why do they occur?

PRMDs can happen for a number of reasons, from pre-disposed genetic conditions to poor posture to overuse of muscles.

## How often do they occur?

A 2013 study led by a researcher at Harvard Medical School found that most (84%) of musicians had experienced performance-impairing pain.<sup>3</sup>

### Risk Factors<sup>4</sup>

- Gender
- Age
- Size/Strength
- Hypermobility (more flexible than normal)
- Musculoskeletal Disease (such as arthritis)

### Contributing Factors for Musicians

- Practice and rehearsal habits
- Rapid increase in playing time
- Technique
- Repertoire
- Instrument size and conditions
- Reed strength
- Posture

## Prevalence of PRMDs

A 2018 National Institute of Safety and Health (NIOSH) study of amateur musicians in student orchestras found a high prevalence of PRMDs:<sup>5</sup>

	<b>Strings</b>	<b>Woodwind</b>	<b>Brass</b>	<b>Other*</b>
<b>Mouth/Jaw</b>	10.8%	20.8%	20.3%	0%
<b>Neck</b>	37.1%	25.0%	15.3%	12.5%
<b>Shoulders</b>	59.1%	36.5%	28.8%	43.8%
<b>Upper Back</b>	32.3%	15.6%	10.2%	6.2%
<b>Lower Back</b>	23.7%	12.5%	15.3%	12.5%
<b>Hand/Wrist</b>	26.3%	26.0%	10.2%	25.0%

*\*Percussion, piano, and harp*

Note: The table above is a highly condensed version of the original chart.

Specific studies on clarinet, saxophone, flute, trumpet, French horn, trombone, and tuba among others can be found online at the Texas Center for Performing Arts Health (TCPAH): <https://tcpah.unt.edu/>

## What is being done to increase awareness in Texas?

The recommendations by the TCPAH (located at the University of North Texas) were instrumental in changing policy at the national and state level that directly influences the education and awareness of musicians' health.

Texas is the first state in the nation to mandate performing arts health awareness and education to junior high and high school students.

### **Did you know?**<sup>6</sup>

Under the Texas Essential Knowledge and Skills (TEKS) requirements, students should explore, describe, demonstrate, and apply concepts relating to:

- body mechanics
- hearing protection
- vocal health
- hydration, and
- appropriate hygienic practices

## Overuse Syndrome

One example of a musculoskeletal issue that may arise is **overuse syndrome**: “A condition of pain and loss of function in muscle groups and joint ligaments as a consequence of excessive or unaccustomed use.”<sup>7</sup>

In other words, it is pain or injury related to performing the same task too much. Just like a runner can't tackle too many miles at once, musicians need a break too.

### What are the symptoms of overuse syndrome?<sup>8-10</sup>

- Pain (throbbing, sharp, cramping, stabbing, gnawing, burning, stabbing, etc.)
- Tenderness and/or swelling
- Loss of function (strength, stamina, etc.)

## Seeking Help for PRMDs

Each PRMD is going to need to follow a different set of protocols. Be open with your teacher and/or with your health provider about any pain or other symptoms you experience while playing your instrument.

Some common recommendations to help prevent and/or cure PRMDs include targeted stretching exercises, changing warm-ups or length of practice sessions, adjusting repertoire, modifying instrument, improving body awareness, cross-training, and improving overall fitness levels. Work with your health provider and teacher to find a plan that is best for you.

### **Additional Resources**

#### **Genetics Home Reference:**

<https://ghr.nlm.nih.gov/primer/basics/gene>

#### **MedlinePlus – Muscle Disorders:**

<https://medlineplus.gov/muscledisorders.html>

#### **MedlinePlus – Tendinitis:**

<https://medlineplus.gov/tendinitis.html>

#### **National Institute of Arthritis and Musculoskeletal and Skin Diseases:**

<https://www.niams.nih.gov/community-outreach-initiative/understanding-muscle-health>

## Music Performance Anxiety

**Music Performance Anxiety (MPA)** may be defined as any emotion or physical response that occurs during a performance and impacts the outcome of the individual's performance.

### Mental Symptoms<sup>11</sup>

- Negative expectations
- Lack of concentration
- Fear of failure
- Negative imagery surrounding performance

### Physical Symptoms

- Tension
- Sweaty or clammy hands
- "Butterflies"
- Loss of embouchure
- Poor breath support

## Reframing MPA for Positive Performance Outcomes

Studies show that incorporating higher levels of preparedness, increasing self-confidence, and incorporating mindfulness practices can help students rethink music performance anxiety as a positive experience.

### Preparedness and Self-Confidence<sup>12</sup>

- Ensure that you have thoroughly prepared for performances by practicing your repertoire
- Practice giving performances to your colleagues and peers to get used to how your body responds under pressure

### Mindfulness Practices

- Yoga<sup>13</sup>
- Meditation<sup>14</sup>
- Visualization<sup>15</sup>
- Progressive Muscle Relaxation<sup>16</sup>

## How can I help my students overcome MPA?

- Build an environment in your classroom/studio that allows students to build self-confidence when they perform well under pressure
- Be able to recognize changes in your students' behavior when performances are looming
- Be able to refer your students to the appropriate counselors to assist them with persistent and extreme symptoms of MPA

### Additional Resources

#### **MedlinePlus – Anxiety:**

<https://medlineplus.gov/anxiety.html>

#### **MedlinePlus – Stress:**

<https://medlineplus.gov/stress.html>

#### **National Institute of Mental Health:**

<https://www.nimh.nih.gov/health/topics/anxiety-disorders/index.shtml>

#### **PubMed – Stress-related journal articles:**

<https://bit.ly/2HQXeMG>

## Hearing Loss

**Noise-Induced Hearing Loss (NIHL)** is defined by the National Institutes of Health (NIH) as “when an individual is exposed to harmful sounds – sounds that are too loud or loud sounds over a long time – sensitive structure of the inner ear can be damaged causing NIHL.”<sup>17</sup>

Noise-induced hearing loss is irreversible, and music educators, parents, and students can work together to find solutions to prevent future damage.

### Limitations of Understanding Musician Hearing

In a NIOSH investigation, researchers found that most band rehearsals ranged from 91-97 and often upwards of 100 dBA (a measure of decibel levels).<sup>18</sup>

#### Did you know?

Marching snare drums average between 95-113 dBA. A jet engine can be around 140!<sup>19</sup>

NIOSH has established a Recommended Exposure Limit (REL) of **85 dBA for eight hours**.<sup>20</sup>

But this was developed for industrial workers exposed to steady noise during 40-hour weeks, **not musicians**.

Currently, the World Health Organization (WHO), the Centers for Disease Control (CDC), NIOSH, and TCPAH are among the few organizations that have recognized the challenges and are working toward perfecting testing protocols for musician's hearing health and solutions for preventative measures.

## Causes

Many believe that “loudness” is the main cause of noise-induced hearing loss.

But it's more accurately described as a combination of **average sound pressure (decibel level)** and the **how long** the ear is exposed to sound.<sup>21</sup>

## Sound Safety Tips for Educators<sup>22-24</sup>

Music educators have the opportunity to greatly impact hearing health of musicians by:

- Recognizing potential hearing loss in the conductor which would effect overall ensemble sound levels
- Exploring the softer range of the dynamic spectrum
- Moderating loudness levels of music they listen to and play
- Reducing repeated exposure to very loud sounds
- Giving ears a periodic rest after exposure to loud sounds
- Getting frequent tests at the audiologist

### What about earplugs?

The evidence isn't clear about the use and design of earplugs for musicians as a way to prevent NIHL.

Additionally, musicians have reported trouble hearing themselves play, problems communicating in chamber settings, and loss of clarity and tone while using earplugs.

A 2009 study by TCPAH, in agreement with NIOSH, found that hearing protectors are “subject to many problems and should be considered as the last resort against hazardous noise in an occupational setting.”<sup>25</sup>

Even earplugs marketed as “musician earplugs” should be used with caution until more is known on the subject.

### **Additional Resources**

#### **MedlinePlus – Hearing Disorders and Deafness:**

<https://medlineplus.gov/hearingdisordersanddeafness.html>

#### **MedlinePlus – Tinnitus:**

<https://medlineplus.gov/tinnitus.html>

#### **National Institute of Safety and Health (NIOSH):**

<https://www.cdc.gov/niosh/index.htm>

#### **World Health Organization (WHO) – Make Listening Safe Initiative:**

[https://www.who.int/deafness/mls\\_consultation/en/](https://www.who.int/deafness/mls_consultation/en/)

## Vocal Health

**Vocal hygiene** encompasses habits and practices that sustain a healthy and strong voice.<sup>26</sup> Here are some dos and don'ts that vocalists or educators may find helpful.

### Dos

- Stay hydrated! Monitor your urine to make sure it is clear or pale yellow.
- Mind the side effects of your medications (i.e. asthma medicine, antidepressants, etc.).
- Ensure you are getting about 8 hours of sleep each night.
- Use a supported and resonate voice.

### Don'ts

- Consume acid reflux-causing foods such as spicy foods, acidic beverages, and alcohol.
- Be exposed to irritating environments (i.e. smoke, paint fumes, auto exhaust, etc.).
- Drink caffeinated or acidic beverages, whenever possible.
- Smoke or vape.

## Symptoms of Vocal Fatigue<sup>27</sup>

Vocal fatigue occurs when singing or speaking to the point that your body begins to compensate for the stress put on your vocal mechanism.

- Hoarseness
- Change in laryngeal sensation (tension in the muscles of the neck)
- Loss of dynamic control (typically, soft speaking/singing becomes difficult)
- Speaking voice becomes tired and strained
- Clearing of the throat, excessive swallowing

## The Lombard Effect<sup>28</sup>

Vocal abuse is more likely to occur when speakers increase the volume of their voice in the presence of background noise for long periods of time.

- Cheering at a football game
- Singing over loud music in a vehicle
- Talking in a noisy cafeteria or classroom
- Over singing during a choral rehearsal

## How can educators minimize vocal fatigue for students?<sup>26</sup>

- Encourage students to reduce practice sessions to smaller increments spaced throughout the day
- Monitor your students' exposure to loud situations during rehearsals (to reduce the Lombard Effect)
- Incorporate some vocal unloading exercises into rehearsals
  - Lip buzzes
  - Tongue Trills
  - Straw work

### Additional Resources

#### **MedlinePlus – Voice Disorders:**

<https://medlineplus.gov/voicedisorders.html>

#### **National Institute on Deafness and Other Communication Disorders (NIDCD) – Hoarseness:**

<https://www.nidcd.nih.gov/health/hoarseness>

#### **PubMed – Voice disorder-related journal articles:**

<https://bit.ly/2I0fqUd>

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