

**Basic Information on
Neuromusculoskeletal and Vocal Health**

**Information and Recommendations
for Administrators and Faculty
in Schools of Music**

**National Association of Schools of Music
Performing Arts Medicine Association**

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Introduction

The National Association of Schools of Music (NASM) and the Performing Arts Medicine Association (PAMA) have developed a comprehensive overview of neuromusculoskeletal and vocal health issues for postsecondary schools and departments of music.

This document provides a comprehensive overview for administrators and faculty.

It is oriented toward decision-making about neuromusculoskeletal and vocal health in the context of a school or department of music.

Information of a medical nature is provided by PAMA; information regarding contextual issues in music programs, by NASM.

***Please note:** Information in this Web resource is subject to amendment or change at any time without prior notice. Please refer back to the document from time to time.*

Use the hyperlinks in the fast tracks below or in the [table of contents](#) to link to specific sections.

Fast Tracks

- [Neuromusculoskeletal and Vocal Health: The Basic Issues](#)
- [Contributing Factors](#)
- [Neuromusculoskeletal Issues Affecting the Body](#)
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- [Developing Neuromusculoskeletal and Vocal Health Objectives in Schools of Music](#)

1. Organizations

NASM, founded in 1924, is an organization of schools, conservatories, colleges and universities with approximately 640 accredited institutional members. It establishes national standards for undergraduate and graduate degrees and other credentials and is the national music accrediting agency. NASM also provides information to potential students and parents, consultations, statistical information, professional development, and policy analysis.

PAMA, founded in 1989, is an organization composed of dedicated medical and health professionals, artists, educators, and administrators with the common goal of improving the healthcare of the performing artist. PAMA members are professionals in fields that include research, education, and clinical practice, and who hail from all corners of the globe.

2. Disclaimers

- a. NASM and PAMA are providing this Web resource for institutions that teach music to assist local consideration and action about neuromusculoskeletal and vocal health.
- b. The information
 - is generic, presentational, and advisory in character.
 - is oriented far more to musicians and lay persons than to medical, scientific, or research professionals concerned with neuromusculoskeletal and/or vocal health.
 - does not substitute for the professional judgments of medical and other professionals working in their areas of documented expertise.
 - is not to be considered as professional advice or to be used as a basis for the medical treatment of specific individuals.
 - does not supersede present and future empirical research that may confirm, contradict, expand, or change the medical or other information provided here at any point in time.
 - does not serve as the basis for the accreditation function of NASM or as an addition to the accreditation standards and procedures of NASM. (A *Handbook* containing standards and a set of *Membership Procedures* are published separately by NASM.)
 - is not an endorsement of the reference materials listed or cited; nor does it represent an endorsement of other opinions, methods, or approaches described in the text.
- c. Health and safety depend in large part on the personal decisions of informed individuals. Institutions have health and safety responsibilities, but fulfillment of these responsibilities cannot and will not ensure any specific individual's health and safety. Too many factors beyond any institution's control are involved. Individuals have a critically important role and each is personally responsible for avoiding risk and preventing injuries to themselves before, during, and after study or employment at any institution. This set of advisory information on neuromusculoskeletal and vocal health and institutional actions taken under their influence or independently do not relieve the individual from personal responsibility for appropriate, prudent, and safe behavior or action, nor do they shift such responsibility and liability for the consequences of inappropriate, imprudent, and/or unsafe behavior or action in any instance or over time to any institution, or to NASM, or to PAMA.

3. Acknowledgements

NASM and PAMA acknowledge with gratitude the efforts of the many past and present professionals in various medical, health, research, and music-related fields who developed the scientific and practical information summarized in this set of resources. They express appreciation to the members of PAMA and NASM who made comments and suggestions on drafts of this and other documents in this Web resource.

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Part I. Neuromusculoskeletal and Vocal Health Facts and Concepts

Neuromusculoskeletal and Vocal Health: The Basic Issues

The human neuromusculoskeletal system is comprised of the nervous system, the muscular system, and the skeletal system. Together, these systems support the body's physical structure and enable movement.

In these resource documents, the term “neuromusculoskeletal” is used to encompass not only overt physical movements (the pressing of a key, the strumming of a string), but also the small internal movements our bodies make, for example to produce breath and modify vocal sounds.

Vocal health is referred to as a component of neuromusculoskeletal health within these documents. When the term “neuromusculoskeletal” is used, vocal health is included. Direct references to vocal health – for singers, instrumentalists, and future music teachers alike – are interspersed throughout the text. Special attention is devoted to issues of vocal health in the sections neuromusculoskeletal issues affecting the voice and vocal protection.

“Neuromusculoskeletal” also includes the body's position in space and the relationship of the skeletal system to corresponding muscles and tissues. Terms such as “alignment” or “posture,” which often refer to spinal positioning, weight distribution, muscular support, and balance, are important talking points in conversations about musicians' neuromusculoskeletal health.

Good health and healthy behaviors are important to all musicians, regardless of instrument and area of specialization.

For example, although singers are usually provided with more detailed information during their voice studies, basic overview understanding of vocal health is essential for all musicians. All use their voice in speaking, and many are engaged with the singing voice in their roles as conductors, coaches, teachers, recording engineers, researchers, therapists, and so forth.

The various neuromusculoskeletal and vocal disorders that affect musicians have many varied contributing factors. Some may be genetic in nature or result from an infection. Others may be the result of trauma or injury. Still others are related to certain behaviors, either in isolation or those that are repeated over time.

Musicians coping with or developing certain neuromusculoskeletal conditions, complications, or disorders may find that they have a negative impact on their ability to play, sing, and practice music.

Preventative measures need to be taken by individual musicians and institutions where musicians study and work. These may include, but are not limited to the provision of information, applications of information in decision-making and culture building, and modifications to the musician-instrument interface.

Purpose of this Web Resource

This Web resource is focused on neuromusculoskeletal health, on neuromusculoskeletal disorders related to the musician's body and voice, on preventative measures, and on how schools and departments of music can work appropriately and comprehensively with associated medical, health, educational, public information, legal, and other issues.

This information is to be used in service of a goal in individual institutions to provide conditions that support neuromusculoskeletal and vocal health.

The first essential is information about neuromusculoskeletal and vocal health and preventative action.

Without knowledge of what can happen and how to minimize risk, music students and professionals have little basis for making informed decisions to care for their neuromusculoskeletal and vocal health and that of other musicians with whom they work.

For each school or department of music, neuromusculoskeletal and vocal health are addressed in a multi-faceted context.

Charting an effective course to promote and provide the best environment for neuromusculoskeletal and vocal health means working with many issues and forces beyond providing information for students, faculty, and administrators.

To be successful, a comprehensive neuromusculoskeletal and vocal health program needs to be sustained from year to year.

This resource provides the basis for instructional efforts to provide information and develop a plan for supporting neuromusculoskeletal and vocal health with a particular focus on minimizing conditions that could contribute to singing and playing-related neuromusculoskeletal disorders.

Basic Facts

Music, the Musician, and Neuromusculoskeletal Health

Musical performance is a physical activity that involves movements both big and small, those we can see and those inside the body.

Musical performance involves the conscious positioning of the body into specified playing and/or singing postures, some of which may seem unnatural at first.

A musician's practice routine is often physically demanding and time-intensive.

For serious musicians, especially those studying, singing, and playing music at advanced levels, "days off" are few and far between.

Some musicians, at some point in their careers, may develop one or more neuromusculoskeletal conditions, complications, or disorders related to their engagement in musical activities.

Decisions about practice and performance play an important part in the neuromusculoskeletal health of musicians, but numerous factors contribute to an individual's neuromusculoskeletal fitness.

Musicians are responsible for their art form, and for supporting the well-being of other musicians.

Cultivating the most positive personal and professional relationships between musical performance and neuromusculoskeletal health is part of that responsibility.

Like so many issues in music itself, optimum effectiveness depends on balanced applications of knowledge and skill in varying circumstances by thousands of individual student, professional, and amateur musicians day after day.

The Neuromusculoskeletal System

The musculoskeletal system is a complex system of muscles, tendons, ligaments, bones, joints, and associated tissues that move the body, allow for speech, and that help the human body to maintain its form.

The term “neuromusculoskeletal” expands upon “musculoskeletal” to include the nervous system.

The nervous system coordinates voluntary and involuntary actions and transmits signals to different parts of the body.

The nervous system is comprised of the central nervous system (CNS) and the peripheral nervous system (PNS). The central nervous system includes brain and spinal cord. The peripheral nervous system is made up primarily of nerves, which allow the central nervous system to communicate with the rest of the body.

Vocal Anatomy

The human voice is produced by four component systems. These are often referred to as the “generator,” the “vibrator,” the “resonator,” and the “articulator.”

The “generator” is the breath provided by the lungs. The principle muscle involved in breath is the diaphragm, a dome-shaped muscle that extends along the bottom of the rib cage. The diaphragm is assisted by various muscles in the abdomen, ribs, chest, and back.

The “vibrator” is the larynx, commonly referred to as “the voice box.” Horizontally stretched across the larynx are two infoldings of mucous membrane called vocal folds, or more frequently “vocal cords.” When breath regulated by the generator passes along the vocal folds, vibrations occur.

The “resonator” is the resonating cavity above the larynx that is responsible for giving the voice its tonal quality. This resonating cavity includes the vocal tract, much of the pharynx (the throat), the oral cavity, and the nasal passages.

The “articulator” includes the tongue, lips, cheeks, teeth, and palate. These structures help to shape sounds into recognizable words and specific vocalizations.

These four component parts work together to produce human speech and singing.

Disorders of the Neuromusculoskeletal System

The causes and contributing factors of neuromusculoskeletal disorders vary, but they generally fall into the one of the following categories: (1) genetic or related to a pre-existing medical condition, (2) trauma- or injury-related, (3) behavior-related.

Common symptoms of neuromusculoskeletal disorders include pain, stiffness, aching, throbbing, cramping, and muscle weakness.

Some disorders may be permanent, while others may be temporary.

Those disorders that are temporary may respond well to rest and/or behavior modification. Others may require medical intervention or therapy.

Sustained behavior modification may lead to the elimination or reduction of certain symptoms or disorders.

Contributing Factors

The causes of behavior-related neuromusculoskeletal disorders are manifold. However, most fit into one of two basic categories or factors. They are: 1) overuse and/or misuse and 2) genetic factors.

1. Overuse/Misuse

The human body has certain physical limits. Exceeding these limits can often lead to injury. In the arts-medicine arena, “overuse” is defined as a practice or activity in which anatomically normal structures are used in a so-called normal manner, but to a degree that has exceeds their biological limits. Such overuse produces certain physical changes, often accompanied by corresponding symptoms or complaints. The degree of excessive activity needed to produce these results varies from person to person and seems to be related to a person’s individual anatomy and physiology.

Another key term in this category is misuse. “Misuse” is defined as a practice in which anatomically normal structures are used in an abnormal manner and/or to an excessive degree, sufficient to produce specific symptoms. Such misuse places certain bodily structures under stress.

Related to both overuse and misuse is abuse. Abuse should be considered as a causative or contributing factor when an activity is performed not only excessively (overuse) or improperly (misuse), but also in a conscious, willful manner. Such self-imposed abuse often produces deleterious physical effects. Under certain circumstances, both overuse and misuse can turn into abuse. A common example of abuse is “playing through the pain.” This abuse involves persisting in long intervals of practice or performance in the face of pain without appropriate rest breaks or activity modification. Some examples of vocal abuse in singers include repeated instances of singing too loudly or singing out of range. Abuse may also be the use of dangerous substances.

2. Genetic Factors

For instrumentalists, the most common genetic factor influencing behavior-related neuromusculoskeletal disorders is hypermobility. It is also known as joint hyperlaxity or the trait of being “double jointed.” Such instability of certain joints may predispose an individual to muscle pain syndromes and/or tendinitis, an inflammation of the tendon. (A tendon is a tough band of fibrous connective tissue that connects muscle to bone.)

Hypermobile joints possess a greater than normal range of motion. Individuals with hypermobile joints have the tendency to compensate for the instability of the joint by using more muscle tension when completing movements or tasks involving the joint. While this extra muscle tension allows for better control over certain movements, such tension can actually increase one’s risk of damaging or straining a muscle.

Individuals with hypermobile joints are generally advised to monitor and actively reduce the amount of tension that they carry in their muscles. Specific strengthening exercises can also help, and in

some instances, people with hypermobile joints may be well served by external methods of joint support, such as small ring splints or tape.

Musicians and Risk Factors

Two facts are clear:

- Neuromusculoskeletal health is essential for musicians.
- Many behavior-related neuromusculoskeletal disorders are preventable.

Two conclusions are obvious:

- Musicians have basic neuromusculoskeletal health responsibilities
- Healthy neuromusculoskeletal behaviors are a critically important addition to the musician's portfolio of essential disciplines.

Constant attention is necessary, because in many cases neuromusculoskeletal damage develops gradually over time.

The severe or advanced symptoms of certain neuromusculoskeletal disorders may be career-ending for a musician.

Even if debilitating problems do not occur initially, career activity becomes increasingly difficult and finally impossible as neuromusculoskeletal disorders proceed to more advanced stages.

What do these facts and conclusions mean for musicians and for schools and departments of music?

Musicians necessarily engage in repeated neuromusculoskeletal behaviors and hold particular postures when they rehearse and perform. But such behaviors and postures do not equal automatic risk of one or more neuromusculoskeletal disorders. There are many factors involved in benchmarking and determining the inherent physical risk.

For musicians, managing neuromusculoskeletal health starts with understanding basic facts and avoiding the most obvious problematic behaviors, postures, and situations.

A behavior is risky when it involves overuse, misuse, or abuse of certain bodily components, or if it fails to recognize and adapt to an individual's physical limitations, genetic or otherwise. A list of basics is provided in ***Contributing Factors***.

There is more, however. Like most other decisions in advanced music-making, thoughtful judgments about what to do and what not to do for yourself and for others involve gaining in-depth knowledge and applying it with sophisticated understanding.

In all musical settings, a number of variables are interacting at the same time. These interactions are unique to specific settings and situations.

Four major variables influence a musician's risk for singing- and playing-related neuromusculoskeletal disorders. Some are intrinsic; others are extrinsic to the musician. Some may be modifiable; others, non-modifiable.

The four main categories of risk factors include:

1. *Intrinsic factors – non-modifiable.*

- a) *Gender.* Studies reveal a greater prevalence of problems in female than male instrumentalists. This seems to be related to the smaller average size of the female hand and fingers, as well as the relatively smaller bulk and cross-sectional dimensions of their muscles. On average, female muscle strength is 15% less than that of males.

With regard to vocal range, or the span of “musically useful” pitches that a singer can produce, female musicians tend to have higher ranges than their male counterparts.

- b) *Anatomy.* For instrumentalists, intrinsic factors such as height, hand size, lung capacity, and joint hypermobility may affect the ways students play certain instruments and, in some cases, may affect their choice of repertoire.

For singers, intrinsic factors include lung capacity, vocal range, tessitura, and timbre among others. These factors affect the assignment of voice type (bass, baritone, tenor, countertenor, contralto, mezzo-soprano, and soprano) and, as a result, the parts and songs that singers are expected and selected to sing.

Anatomy is unchangeable, so it is important to develop technique and an approach to playing and singing music that takes this situation into account.

2. *Intrinsic factors – modifiable.*

- a) *Alignment.* Poor body alignment, sometimes referred to as “bad posture,” can increase the risk of injury. Proper body alignment, including good balance and body positioning, is vital to the continued health of musicians.
- b) *Quality of movement.* Since sound is the result of movement, both at micro and macro levels, the quality of a musical sound is related, at some level, to the musician's quality of movement. It is important that musicians work to maintain high levels of body awareness in order to avoid bound, stiff, or limited movements that can lead to injury.
- c) *Stress and psychological health.* Musicians, like anyone else, are more susceptible to injuries, pain, etc. when under stress and/or depressed. Many of the neuromusculoskeletal problems for which musicians are at risk can, if they become chronic, contribute to a situation that may lead to depression. It is important for musicians to recognize the importance of their psychological health as a part of their overall physical health.
- d) *Motivation and effort.* Improving one's muscle strength and endurance depends on motivation and consistent effort. Exercise and conditioning are important. In some instances, musicians may need to seek expert guidance from a physical therapist, somatic educator, vocal coach, or other healthcare specialist.

3. *Extrinsic factors – non-modifiable.*

- a) *The assigned musical repertoire.* Certain musical pieces pose particular physical and vocal challenges.
- b) *Venue.* Once selected, the space in which one is performing can make injury more or less likely. The acoustics, temperature, lighting, and seating all have an effect on a musician's performance.
- c) *Instrument.* While instruments can be modified to some extent, some characteristics cannot be changed. The frequency of injuries is higher among players of those instruments requiring many repetitions of finger action, as well as instruments that must be held in difficult postures.

Players of large instruments have a greater prevalence of problems. Long arms are needed to hold and play the instrument. Hands must stretch wider to press strings, keys, or valves; this requires greater muscle tension and increased use of the smaller and weaker intrinsic hand muscles. Additionally, these instruments are more difficult to play quickly than smaller instruments because of the greater size and complexity of keywork and valve travel, or greater space between strings and fingerboard.

4. *Extrinsic factors - modifiable*

- a) *Time spent playing or singing.* Perhaps the single most important risk factor that musicians can manage is time: how much time one spends practicing, frequency and nature of rest breaks during practice sessions, how quickly one increases practice time when a major performance is approaching, and how one approaches more technically demanding passages.
- b) *Non-music-related activities.* An often-overlooked risk factor involves non-music-related activities, some of which can be sources of overuse or misuse.

Some fitness and conditioning activities, including sports participation, may place excessive demands on the neuromusculoskeletal system, especially if overdone or done incorrectly. (This is not to say, however, that such activities should be avoided all together, only that engagement should be at safe levels, utilizing proper technique and form.)

In some instances, excessive use of certain electronic devices, including computers, tablets, cell phones, and gaming systems, can pose a risk. As in many things, moderation is key.

Loud social events and those in which cigarette smoke or alcohol are in abundance pose a serious risk to vocal health.

Similarly, some forms of outside employment may also be physically or vocally demanding.

Neuromusculoskeletal Issues Affecting the Body

Muscle Pain

Whether one ascribes muscle pain to overuse, misuse, postural factors, tension, technical problems, or poor conditioning, the principal underlying cause of muscle pain is sore muscles.

Muscles that are fatigued are less able to contract as strongly and frequently as “normal” muscles. With continued use, fatigued muscles are placed under greater stress, often leading to microscopic damage and disruption of the muscle fibers, a condition known as *muscle strain*.

Muscle contraction is a physical-chemical process. When the necessary chemical compounds are in short supply, muscles can no longer operate at optimal efficiency. Furthermore, muscle contraction produces lactic acid; when this substance accumulates in tissues, it minimizes the muscle’s ability to continue efficient contractions.

Both of these consequences of excess muscle use will cause pain during and after the period of use. Once the period of activity is over, some of these side effects will correct themselves. In other instances, muscular pain will continue for variable periods of time.

Playing-related neuromusculoskeletal disorders in all age groups are more commonly seen in specific body locations. Paramount among these are the shoulders, neck, hands/fingers/wrists, and lower back. Some of these locations are more common in specific instruments, e.g., thumb problems in clarinetists, lower back strain and pain in double bass players.

Neuropathies

“Neuropathy” is a general medical term that refers to diseases or malfunctions of the nerves. Neuropathies are classified according to the types or location of the affected nerves.

Focal neuropathy is neuropathy that is restricted to one nerve or group of nerves, or to a particular area of the body. Symptoms usually appear suddenly and can include pain; sensory disturbances, such as numbness, tingling, “pins and 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, which occurs when a nerve passes through a narrowed channel bounded by bone, fibrous bands, bulky muscles, or enlarged arteries on its way to or from its ultimate destination.

In other cases, the pain may be distributed anywhere along the course of the nerve. Muscle weakness and impaired dexterity are often later effects.

The three most commonly identified entrapment neuropathies include 1) carpal tunnel syndrome at the wrist, 2) ulnar neuropathy, and 3) thoracic outlet syndrome.

Carpal tunnel syndrome occurs when the median nerve, which runs from the forearm into the palm of the hand, becomes pressed or squeezed at the wrist. The carpal tunnel – a narrow, rigid passageway of ligament and bones at the base of the hand – contains the median nerve and several tendons. When irritated or strained, these tendons may swell and narrow the tunnel, compressing the median nerve. The result can be pain, weakness, or numbness in the hand and wrist that radiates up the arm. Causes are numerous and varied.

Ulnar neuropathy is a condition in which the ulnar nerve, which runs from the neck along the inside edge of the arm and into the hand on the side of the little (pinky) finger, becomes inflamed due to compression of the nerve. Symptoms include tingling, numbness, weakness, and pain, primarily along the elbow, the underside of the forearm, and along the wrist or inside edge of the hand. Compression of the ulnar nerve is often linked to repetitive wrist or elbow movements. For musicians, sustained elbow flexion, particularly among players of bowed instruments, has been known to contribute to this condition in some cases.

Thoracic outlet syndrome is a group of disorders that occur when the blood vessels or nerves in the thoracic outlet – the space between the collarbone and first rib, become compressed. Symptoms include pain in the neck and shoulder areas and numbness in fingers.

Dystonia

Dystonia is defined as a disorder of sustained muscular contractions, producing unwanted movements or abnormal postures. The cause of dystonia remains unclear.

Focal dystonia is dystonia that affects a particular area of the body. Because men are more likely to develop focal dystonia, it is hypothesized that genetic or hormonal factors may be involved. Additionally, repetitive movements, especially those that are painful, seem to trigger it.

In the instrumental musician, dystonia typically presents symptoms that are localized to the upper limb in keyboard, string, percussion, and woodwind players, and that involve the embouchure in brass and some woodwind players.

The right hand of keyboard players and the left hand of string instrumentalists are most commonly affected.

Neuromusculoskeletal Issues Affecting the Voice

The more common neurological voice disorders in the music student include phonatory instability, vocal strain, and vocal fold motion abnormalities.

Phonatory Instability

Phonation is the process by which air pressure generated by the lungs is converted into audible vibrations. A method of phonation called “voicing” occurs when air from the lungs passes along the vocal folds at the base of the larynx, causing them to vibrate.

Production of a tonal, pleasant voice with smooth changes in loudness and pitch depends upon the symmetrical shape and movement of the vocal folds.

Phonatory instability occurs when there is asymmetrical or irregular motion of the vocal folds that is superimposed on the vocal fold vibration. Phonatory instability often manifests itself as an unsteadiness, hoarseness, or roughness of voice. The condition can be short- or long-term.

Short-term causes of phonatory instability include fatigue, certain medications, drug use, and anxiety. These problems tend to resolve rapidly with removal of the cause, but remain if the causative agent fails to be eliminated.

Over-the-counter allergy medications, antidepressants, and highly caffeinated drinks, which stimulate the nervous system, can cause vocal tremors, a form of phonatory instability.

Vocal Strain and Vocal Fold Abnormalities

Overuse of the voice, whether by singing or speaking, can produce vocal strain. Unlike playing an instrument, singers must be aware of problems singing at the extremes of vocal range, especially the upper end. Both duration and intensity of singing are as important as they are for instrumentalists.

Misuse activities can occur also; examples of this are attempting repertoire that is beyond the individual's stage of vocal maturity and development, and improperly learning and practicing certain vocal styles.

Prolonged overuse, in some cases, can lead to the development of nodules on the vocal folds. The nodules appear initially as soft, swollen spots on the vocal folds, but as vocal abuse continues, they transform into callous-like growths. Vocal nodules require specialized and prolonged treatment and rehabilitation and can be of grave consequence to singers.

Basic Protection for All Musicians

On stage and in life, it is important for musicians to take steps to protect their neuromusculoskeletal health. Musicians and music faculty whose playing- and singing-related behaviors make them susceptible to certain neuromusculoskeletal conditions and disorders may wish to explore the following methods of neuromusculoskeletal health protection:

- Warming up before practice and performance. As appropriate, engage in physical, vocal, and musical warm-up exercises. Mobilize muscles and joints in order to increase blood flow to those body parts that will be moving rapidly and frequently during the playing and performing of music. Lubricate your vocal folds.
- Taking a break from practice and rehearsal whenever possible. A good rule of thumb is a 5-minute rest every half hour.
- Avoiding excessive practice time and stress. Set daily limits, and vary repertoire during practice sessions.
- Avoiding excessive repetition of difficult repertoire, especially if progress is slow.
- Avoiding repertoire that is beyond one's technical or physical reach.
- Refraining from sudden increases in practice times. Instead, slightly reduce total practice time before juries, recitals, etc. in order to allow mind and body adequate energy for performance.
- Ensuring proper body alignment and technique. Be mindful of balance and weight delivery, and ensure adequate freedom of movement and support during practice and performance. If appropriate, adapt an instrument or make use of external support mechanisms, such as shoulder rests, neck straps, and flute crutches.
- Maintaining good "mental hygiene." This includes getting adequate sleep, good nutrition, regular exercise, and spending time with friends and family. Refrain from hazardous or recreational drug use. Seek the help of a mental health professional when appropriate.

- Allowing for relaxation. Injuries are much less likely to occur in persons who are both physically and psychologically fit. Stress management is as important as practice management.

Vocal Protection

It is equally important for musicians to take steps to protect their vocal health. This holds true for all musicians, regardless of performance medium or area of specialization. Musicians may wish to explore the following methods of vocal health protection:

- Drinking plenty of water. The vocal folds need to be lubricated with a thin layer of mucus in order to vibrate efficiently. The best lubrication is achieved by drinking plenty of water. Aim to drink at least eight glasses of water a day.
- Avoiding and/or limiting consumption of caffeinated and alcoholic beverages, as they pull water out of your system and deplete the vocal folds of needed lubrication. If you choose to drink caffeine or alcohol, be sure to sufficiently increase your water intake.
- Not smoking. Smoking irritates and dries out the lining of the larynx. It contributes to decreased vocal quality, promotes reflux laryngitis, and increases the need for throat clearing and “smoker’s cough.” Smoking is also extremely detrimental to lung function, which can make breathing, speaking, and singing more difficult. Also, work to avoid exposure to secondhand smoke.
- Being mindful of antihistamine usage, which dries out the vocal tissues. Be sure to stay well hydrated if you are taking allergy medication. Certain other medications, both prescription and over-the-counter, may have a similar drying effect. When in doubt, check with your doctor and, if appropriate, ask about suitable alternatives.
- Avoiding dry air environments. Forced heat, air conditioners, and climates with low levels of environmental moisture can be hard on your vocal health. Consider using a humidifier at night to compensate for the dryness.
- Avoiding yelling or raising your voice unnecessarily.
- Avoiding throat clearing and voiced coughing.
- Using vocal amplification systems when available and appropriate.
- Resting your voice, especially if you are sick. Remember, it’s important to give yourself adequate time to recover.

A Special Consideration – Marching Music

Marching music is an important part of many colleges and universities. It is usually connected with athletic programs and events. The marching musician must not only be able to play an instrument at a high level of skill, but do it while moving along a street or across an athletic field, often at rapid rates and with irregular movement patterns. Additional physical capabilities are necessary for this to be accomplished without danger. Marching musicians require high levels of physical conditioning, strength, and endurance; they must be in good general health and physically fit.

Additionally, training in marching music produces an additional litany of activity-related physical disorders that must be considered in any school's health program. Problems unique to marching music include lower extremity injuries such as sprained ankles, toe contusions, and knee strains. Carrying heavy instruments places a great physical demand on the neck, torso, lower back, and legs. Training usually occurs outside during the summer, sometimes in high heat and high humidity. Sunburn and dehydration can occur all too easily in the absence of preventative measures. Times of rest and rehydration are vital for marching units. Finally, marching units are usually much larger than most indoor ensembles, and their sound levels often exceed recommended levels, especially during long rehearsals.

Basics Music Professionals Need to Know and Be Able to Do

- Understand and share with others the risks inherent in excessive and improper neuromusculoskeletal use while playing and singing music, including the risk of prolonged or permanent damage to musculoskeletal and neurological tissues.
- Recognize that playing and singing music in inappropriate ways or for extended times can cause playing and singing-related neuromusculoskeletal disorders.
- Monitor practice time and intensity, choice of repertoire, and playing and singing techniques to prevent the development of playing- and singing-related disorders.
- Apply health knowledge in specific musical contexts, such as practice, performance, production, education, competition, and listening.

Students need to gain these knowledge and skills during the course of their studies and preferably as soon as possible.

Part II. Considerations for Faculty and Administrators

A. Issues for Institutional Decision-Makers

Many neuromusculoskeletal and vocal conditions and disorders are preventable and/or treatable. The neuromusculoskeletal and vocal health of musicians is a serious issue that needs serious attention in music schools and departments. Contextual information for connecting neuromusculoskeletal and vocal health to the work of music schools in productive ways is provided below.

Facing Complexity

Music schools and departments are focused on music itself, on making, teaching, studying, and otherwise working with music.

This focus is not possible without constant attention to the relationship between music and people and a concern for the integrity of that relationship.

In the academic setting, the artistic and academic development and the well-being of students are especially important.

Many institutions have the highest artistic aspirations in one or more types of performance. They teach performance, organize to present performances, and maintain spaces for rehearsal and performance.

While the importance of neuromusculoskeletal and vocal health is unquestionable, making decisions associated with neuromusculoskeletal and vocal health in an institutional setting means working with complex mixtures of issues. Neuromusculoskeletal health is part of a bigger picture that includes relationships among music, people, students, artistic aspirations, performances, justification, image, and sustainability.

Administrators and faculty need to find ways to address neuromusculoskeletal health issues effectively in terms of these and other aspects of the complexities present in their institution.

Complexity is also present because there is a great deal to manage in terms of neuromusculoskeletal health itself. For example: identification, coordination, and work with local experts outside the music program; operating orientation, information, and injury-prevention programs; working with facilities, equipment and technology issues; producing public information; and factoring knowledge of the legal issues involved into each decision about what to say and what to do.

The following sections address additional considerations for decision-makers as they include neuromusculoskeletal health in their portfolio of work on behalf of music and musicians.

Institutional and Individual Responsibility

The basics regarding the relationship of musical practice and performance to the neuromusculoskeletal health of musicians are simple. For institutions, several responsibilities are obvious:

- Information about this relationship needs to be provided as broadly as possible to the musically involved of all ages.

- Individuals and organizations that teach and perform music need to pursue their work in ways that support neuromusculoskeletal and vocal health.
- Rehearsal and performance considerations need to support neuromusculoskeletal and vocal health objectives.

None of these efforts, however, is a substitute for individual responsibility once basic information and appropriate conditions have been provided. At that point, in an overall sense, the musically involved individual is ultimately responsible for his or her own musical behavior. This is especially true when the individual is in control of choices about body alignment, positioning, technique, and practice regimens, which require consideration a great deal of the time.

Institutional and individual efforts on neuromusculoskeletal and vocal health are both important. Each effort is in relationship with the other. But one is not a substitute for the other. Ultimately, like so many other things in music, an individual's decisions on a day-to-day basis are the keys to success.

Orientation and information programs on neuromusculoskeletal and vocal health should make these points clear in terms easily understood by students.

Roles and Interactions

Many professions bring expertise and resources to issues of neuromusculoskeletal and vocal health. Each has different basic responsibilities and scope. Students also play a critical role.

For administrators and faculty, it is neither prudent nor responsible to act as though general knowledge of the neuromusculoskeletal and vocal health issues in music can replace professional capability. It is critical to rely on professional expertise and judgment associated with specific areas of expertise and to create cooperative interactions whenever necessary to address a particular issue or problem.

Legally, there is a line between things that everyone can do, such as share accurate information or opinion labeled as opinion, and things that only certified or licensed professionals can do. Crossing that line usually creates dangers for other people and thus, liability. Individuals in schools and departments of music need to know about and observe this line.

The primary roles of professionals in the postsecondary music-related neuromusculoskeletal and vocal health arenas are briefly defined below:

The Higher Education Community

- **Music Administrators in Higher Education** – Address policy, management, and evaluation issues.

With respect to neuromusculoskeletal and vocal health issues, these may include but are not limited to cultivating awareness, facilitating and/or leading the development of information programs for students and faculty, developing neuromusculoskeletal and vocal health protocols, and creating working relationships with professionals in other areas.

- **Music Faculty in Higher Education** – Supervise, instruct, and mentor students, both majors and non-majors, within a music department or music program.

With respect to neuromusculoskeletal and vocal health issues, these may include but are not limited to developing and maintaining a teaching and student practice environment that, to the extent possible, is safe for both self and students within classrooms, studios, rehearsal halls, and concert venues, and informing students and the public about preventative measures related to neuromusculoskeletal and vocal health.

Normally, performance faculty help students understand health issues specific to their instrument or the voice.

- **Music Students in Higher Education** – Engage in departmental, extracurricular, and sometimes professional performances. Develop skills learned in classrooms and private lessons through rehearsals and performances.

With respect to neuromusculoskeletal and vocal issues, students' behavior, both on and off campus and in both academic and non-academic settings, impacts their health.

Students are responsible for refraining from individual choices and behaviors that could compromise neuromusculoskeletal or vocal health. These include, but are not limited to being mindful of the duration and intensity of musical practice, awareness of proper singing and playing techniques and postures, and providing a positive example for other students.

- **Institutional Administration** – Provide institutional leadership to faculty, staff, and students.

With respect to neuromusculoskeletal and vocal health issues, institutional administrators make decisions related to funding. They also make decisions regarding general institutional policies associated with student health.

- **Legal Counsel** - Provide guidance, advice, and representation to institutional administration and faculty.

Maintain access to and provide interpretations of laws, rules, cases, and decisions related to health and safety, including neuromusculoskeletal and vocal health, conditions, and disorders.

Review documents, presentations, programs, policies, and other activities in light of legal requirements and prudent action.

Participate in formulating policies for music faculty and administrators regarding consultation and engagement with licensed or certified medical or healthcare experts, with particular attention to legal cases involving neuromusculoskeletal and/or vocal health.

- **Medical Schools, University Hospitals, and Student Health Centers** – Support and/or coordinate institution-wide neuromusculoskeletal and vocal health awareness programs, orientations, and advocacy campaigns.

Work with departments, such as music and education, to develop partnerships that promote neuromusculoskeletal and vocal safety and injury prevention.

Medical Experts

- **Doctor of Medicine (M.D.)** – Licensed to diagnose, treat, and recommend preventative measures for individual patients. Also conducts and applies research to the development of protocols associated with medical procedures and individual and public health.
- **Doctor of Osteopathic Medicine (D.O.)** – Licensed to diagnose, treat, and recommend preventative measures for individual patients. Well trained in psychoneuroimmunology.
- **Medical Practitioners (most associated with neuromusculoskeletal and vocal issues)**
 - **Family Practice Physician** – Licensed to diagnose and treat all members of a family. Possesses general knowledge of all aspects of medicine. Qualified to diagnose a wide variety of conditions and diseases and perform and/or recommend treatment, when appropriate.
 - **Hand Surgeon** – Focuses on problems of the hand and upper extremity (wrist to shoulder); may be trained in orthopaedic surgery, plastic surgery, or general surgery. Also skilled in both surgical and nonsurgical treatments.
 - **Laryngologist** – Specializes in the diagnosis and treatment of disorders of the larynx and upper aerodigestive tract.
 - **Neurologist** – Specializes in the diagnosis and treatment of nervous system disorders from a medical standpoint.
 - **Occupational Therapist** – Treats patients with injuries, illness, or disabilities through the use of therapeutic activities.
 - **Orthopaedic Surgeon** – Licensed to diagnose and treat many neuromusculoskeletal illnesses and conditions by both medical and surgical means. Skilled at treating patients possessing multiple bone and joint issues. Works with patients of all ages.
 - **Otolaryngologist** – Specializes in the diagnosis and treatment of disorders of the head and neck.
 - **Physiatrist** – Licensed to diagnose and treat many neuromusculoskeletal illnesses and conditions both by medical and non-surgical means with rehabilitation services.
 - **Physical Therapist** – Helps patients with injuries or illnesses to improve their movement and/or manage their pain.
 - **Psychiatrist** – Specializes in the medical diagnosis and treatment of mental disorders. Can prescribe medicine.

- **Psychologist** –Studies, evaluates, diagnoses, and treats issues and conditions related to patients’ mental health. Often provides counseling.
- **Speech-Language Pathologist** – Specializes in communication disorders and swallowing disorders. Known informally as a speech therapist.

Complementary and Alternative Health Practitioners (most associated with neuromusculoskeletal and vocal issues)

Please note: These practitioners should be licensed or certified by their respective professional organization.

- **Chiropractor** – Manipulates and adjusts bones in the spine and joints in order to relieve pain.
- **Massage Therapist** – Manipulates bodily tissues through touch and pressure in order to help relieve patients’ muscle tension.
- **Somatic Educator** – Promotes physical and mental self-awareness. Can assist not only with proper alignment and coordination, but also with injury prevention and/or rehabilitation. Areas of study include Alexander Technique, Body Mapping, the Feldenkrais Method, among many others.

Researchers

- **Medical Researchers** – Research the many causes (genetic or preexisting, trauma-induced, behavior-related) of neuromusculoskeletal and voice disorders.

Develop and refine techniques by which to prevent and diagnose the known causes of neuromusculoskeletal and voice disorders.

Develop and refine potential treatment options.

Conduct clinical trials on patients suffering from severe or advanced-stage neuromusculoskeletal and voice disorders.
- **Health Researchers** – Conduct research in a variety of areas, including public health and occupational health.
- **Psychologists and Physiologists** – Study and report on the connections between mental health, vocal health, and neuromusculoskeletal health.

Examine the effects of neuromusculoskeletal and voice disorders on quality of life.

Provide psychological treatment and counseling to individuals affected by various neuromusculoskeletal and voice disorders.
- **Music-related Researchers**

- Study issues of music and neuromusculoskeletal and vocal health in professional, academic, and private settings.
- Develop neuromusculoskeletal and vocal health information useful to musicians, students, and those with an interest in music.
- Provide analyses and recommendations for music policymakers.

Information and Message Considerations

Music schools and departments produce many types of public information, including information for students and faculty. All such public information is intended to reflect positively on the field of music, the value of music study, and the quality of the institution's music program.

Music schools and departments cost money. Constant expenditure justification is usually necessary. Justification includes maintaining an accurate and positive image about music and music study. Performance is a major indicator of achievement and value in most academic settings.

The future of a college- or university-based music program depends on external belief in its value and on its ability to bring credit to the institution as a whole. Music is in jeopardy if it is viewed as a real or potential liability.

Music is a complex field with many issues and connections. For musicians, neuromusculoskeletal and vocal health are critical parts of a larger whole. Musicians' health is a central concern, but music remains the core concern. Naturally, for various neuromusculoskeletal and vocal health professionals, the opposite is the case. However, for optimum public information success on neuromusculoskeletal and vocal health questions, music, vocal, and neuromusculoskeletal health professionals must work together.

The administrative challenge is obvious. Music administrators need to seek accuracy and balance as information is provided to students who are future music professionals, students majoring in other fields, the larger academic community, and the public at large.

Information about any subject can be worded in ways that produce a variety of impressions and effects on individuals and groups. For example, the message, "Music produces neuromusculoskeletal and vocal disorders" denigrates music generically. The underlying theme is negative toward music itself and to any encounter with it. In contrast, the message, "Enjoy playing music and singing in ways that support your neuromusculoskeletal and vocal health" lifts music and neuromusculoskeletal and vocal health into a positive relationship.

Honesty and integrity are essential. Oversimplification often produces misrepresentation. A statement can be literally true, but mislead by what is left unstated.

Public information about music and neuromusculoskeletal and vocal health needs to be comprehensive, even when the message is brief. The following questions may be useful in testing messages of any length about music and neuromusculoskeletal and vocal health for balance, relationship, honesty, and integrity.

1. Does the message itself and its underlying theme:
 - build respect for the value of engagement with music and music study?

- produce attention to basic neuromusculoskeletal and vocal health issues associated with intensity, duration, technique, and posture?
 - connect music to neuromusculoskeletal and vocal health in a positive way?
2. If it addresses or has an impact on any of the topics below, does the message:
- indicate or allude to the multiple sources of influence on individual neuromusculoskeletal and vocal health?
 - inspire personal responsibility and engagement in managing one's own behavior?
 - place facts and numbers in contexts that produce comprehensive factual clarity?
 - affirm the relationship between individual and institutional roles in promoting neuromusculoskeletal and vocal health?
 - reflect the distinction between general information and the provision of professional advice or individual medical diagnosis or treatment?
 - engender cooperation and trust among those with various responsibilities for music and for neuromusculoskeletal and vocal health?

Legal Issues

Neuromusculoskeletal and vocal health have legal dimensions just like every other issue in our society. Although not the first consideration, these legal dimensions are extremely important to consider in developing and operating a neuromusculoskeletal and vocal health program in a school or department of music.

The following items are intended as a springboard for consultation with legal counsel and local consideration and action in the music school.

- Provide information about musculoskeletal health to all associated with the program. Review the comprehensive nature of the issue. If possible, engage licensed or certified medical or healthcare personnel to present medical information and answer questions about medical issues.
- Ensure the accuracy and currency of any health information you provide.
- Document the source of any information provided by the medical or research communities. Use only authoritative sources.
- Develop and use a policy statement that separates the functions of information and referral on one hand, and medical diagnosis, advice, and treatment on the other.
- Clarify to all faculty, administrators, and staff that under no circumstances is anyone to attempt to provide advice of a medical nature unless licensed to do so. Warn of the dangers inherent in even being construed as offering such advice.
- Present health issues comprehensively, especially in general orientations.

- Emphasize the importance of individual responsibility and that the scope of this responsibility extends beyond music.
- Explain what the institution does with regard to neuromusculoskeletal and vocal health and connect each item with individual responsibility at all levels.
- Document the basic elements of any neuromusculoskeletal and vocal health program you develop and use (see Developing Neuromusculoskeletal and Vocal Health Objectives in Schools of Music). This includes but is not limited to documenting:
 - points made in general orientations of students and faculties;
 - policies and procedures regarding neuromusculoskeletal and vocal health in various aspects of the program; and
 - musician-instrument interface considerations.
- Be consistent. Follow any and all procedures that you have established. Change your documented procedures before changing your practices.
- Place appropriate disclaimers on published information and Web sites as applicable to the text, for example:
 - *The information provided here is for information purposes only and is not a substitute for medical advice or treatment by a certified or licensed medical or healthcare professional.*
 - *The information provided here is for information purposes only by the [name of organization], an association of [characteristics of members, e.g. medical doctors].*
 - *The information provided here is not a substitute for each individual's responsibility to cultivate his or her own neuromusculoskeletal and vocal health on a daily basis.*
 - *The information provided here is current as of [date]. Newer information may be available.*
- Work in the context of the health management and other applicable systems at your institution.
- Have your neuromusculoskeletal and vocal health programs, procedures, and published information reviewed by institutional or other qualified attorneys before putting them into place and periodically thereafter, especially when substantive changes are proposed.
- Work with your attorneys to develop a legally defensible and technically accurate approach to neuromusculoskeletal and vocal health.

B. Developing Neuromusculoskeletal and Vocal Health Objectives in Schools of Music

Introduction

The following objectives are associated with achieving a specific goal: developing and maintaining a comprehensive neuromusculoskeletal and vocal health program in a school or department of music.

There are many other ways of stating and organizing objectives for this purpose.

Individual institutions decide on the specific means for accomplishing these and any other objectives they establish regarding neuromusculoskeletal and vocal health.

Of course, the means chosen need to accomplish the objective.

These statements are not accreditation standards, and must not be referenced as such. Statements of NASM standards are found only in the NASM *Handbook*.

Information and Recommendations for Faculty and Staff in Schools of Music

1. *Orient entering music students*

Entering students need information about:

- The fundamentals of neuromusculoskeletal and vocal health.
- The fundamentals about neuromusculoskeletal and vocal conditions and disorders common to musicians.
- Avoiding risks and preventing neuromusculoskeletal and vocal damage related to overuse, misuse, or abuse of the body.
- School or departmental policies and practices, and mechanisms for addressing concerns.
- Links and referrals to medical and health-related expertise and assistance.
- Personal responsibility.

Music programs are also encouraged to lead in the development of awareness campus-wide, particularly in cooperation with other interested groups.

To assist with student orientations and other awareness programs, NASM and PAMA have created the following documents, which may be edited to fit the needs and goals of the institution, school, or department of music.

Protect Your Neuromusculoskeletal and Vocal Health Every Day: Information and Recommendations for Student Musicians

A Sample Order and Script for Music Student Orientation

Standard Version

Version for Customization

Student Text Version of the Orientation Script

Standard Version

Version for Customization

Protecting Your Neuromusculoskeletal Health: Student Information Sheet

Standard Version

Version for Customization

Protecting Your Vocal Health: Student Information Sheet

Standard Version

Version for Customization

2. Orient and engage faculty, staff, and administrators

In addition to information listed for students, faculty and staff need information about:

- Their role and relationship to medical and health-related professionals.
- How to work with students on neuromusculoskeletal and vocal health issues, and with school or departmental mechanisms for addressing concerns.

Basic information on neuromusculoskeletal and vocal health for faculty, staff, and administrators can be found in the following NASM/PAMA document. Like the student documents listed above, it too may be altered to fit the needs and goals of the institution, school, or department of music.

Information and Recommendations for Faculty and Staff in Schools of Music

3. Define and teach basic information needed by music professionals.

a. All Musicians

- (1) Understand and share with others the risks inherent in excessive and improper neuromusculoskeletal and vocal use while singing or playing music, including the risk of prolonged or permanent damage to musculoskeletal, neurological, and vocal tissues.
- (2) Recognize that playing and singing music in inappropriate ways or for extended times can cause playing- and singing-related neuromusculoskeletal disorders.
- (3) Monitor playing time and intensity, choice of repertoire, and playing and singing techniques to prevent the development of playing- and singing-related disorders.
- (4) Apply health knowledge in specific musical contexts, such as practice, performance, production, education, competition, and listening.

b. Future Music Teachers

In addition to items 3.a.(1) through (4) above, the knowledge and skill to:

(1) Teach students about neuromusculoskeletal and vocal health.

(2) Manage various ensemble-based instructional activities in ways that produce a positive relationship among artistic goals, expressive possibilities, and neuromusculoskeletal and vocal health.

4. *Secure cooperative consultative relationships with local healthcare experts, especially with regard to:*

a. Content and presentation texts and events associated with orientation and education.

b. Reviews of the school's neuromusculoskeletal and vocal health policies and protocols.

c. Notice of new information applicable to music schools.

5. *Maintain a system for referring individuals to licensed or certified medical or healthcare professionals, including but not limited to:*

a. Clear policies about maintaining distinctions between

(1) Sharing basic information or observations and

(2) Medical advice.

b. Simple criteria and protocols for determining that referral is indicated.

c. A list of medical professionals that accept referrals.

6. *Create guidelines and protocols regarding musician-instrument interface, for example:*

a. Use of external support mechanisms, such as shoulder rests, neck straps, and flute crutches.

b. Guidelines and protocols for the duration of rehearsals and the timing of rest periods.

7. *Make word and image choices that serve both music and neuromusculoskeletal and vocal health. (See Information and Message Considerations.)*

8. *Sustain a consultative relationship with legal counsel, especially with regard to Legal Issues.*

C. The Administrator's Role: Regular Coordination in a Dynamic Setting

Consider Interacting Relationships

Administrators work in dynamic settings.

The factors creating specific situations change, as do the relationships of the factors to each other.

These changes occur on different schedules and in different proportions in individual schools and departments.

Each institution is unique, and there are no detailed formulas that work universally.

Common objectives and factors regarding neuromusculoskeletal and vocal health need to be incorporated into a custom design that is resilient enough to succeed in the larger dynamic of the school as a whole.

Looking holistically from the administrative perspective, major areas engaged in dynamic action and relationships with neuromusculoskeletal and vocal health include:

- The art of music itself and creative and performance developments within it.
- Educational efforts in music, including associated time, expertise, and resource allocations.
- Personnel – students, faculty, administrators, medical experts, researchers, etc.
- Knowledge, research, scholarship, and new developments in the field of neuromusculoskeletal health.
- Current and evolving protocols, regulations, standards, and legal considerations.
- Facilities, equipment, and technology.
- Approaches and systems for providing information means and protocols for factoring neuromusculoskeletal and vocal health issues into operational, artistic, and educational decisions.
- Evaluation for specific purposes such as adequacy, currency, and improvement.
- Images and values building for music, musicians, and the music school.

Remember the Influence of Size and Scope

The scope and complexity of working with relationships among these factors is normally related to the size, scope, and complexity of the music program. The number of students and the types and levels of degree or program offerings have great influence on the type and nature of health coordination needed.

Create a Local Plan

The first challenge is to build an objective-based local plan that takes all important factors into account.

The choice of **objectives**, their working, ordering, and means for achievement need to be as simple as possible given the size and scope of the program.

Simplicity can promote efficiency. Efficiency usually produces incentives to participate.

Participation is necessary because the aggregate result is produced by a vast number of individual decisions.

Plan development is strengthened by consultations involving music faculty, students, neuromusculoskeletal and vocal health professionals, attorneys, and other related parties.

Consider the Local Plan in Relation to Local Objectives

A second challenge is to take each basic element of the local plan chosen and consider it carefully in terms such as the dynamic relationship among:

- The fundamental specific objective (neuromusculoskeletal and vocal health orientation for entering students, or coordination with local health professionals, for example);
- Common knowledge, and specialized information or research associated with the specific objective;
- Availability, accessibility and probability of internal and external resources to address the specific objective;
- The fastest, most effective means of reaching the objective in the specific local situation; and
- An assessment of how well the element will work in relationship to other elements and objectives in the larger neuromusculoskeletal health plan and in the purposes of the music school or department.

These considerations provide the basis for (a) making adjustments to specific elements and the plan as a whole, (b) completing the entire plan, and (c) implementing the plan with confidence.

Coordinate the Constituencies

A third challenge in the promotion of neuromusculoskeletal and vocal health is to develop and maintain the regular coordination within the school's health effort. Some of the most important administrative coordination issues are:

- Remaining sufficiently current with neuromusculoskeletal and vocal health issues to engage at a strategic decision-making level for the school.
- Ensuring that analysis and action are based on current, accurate, and authoritative information.
- Sustaining the means to accomplish any single neuromusculoskeletal or vocal health goal.
- Sustaining the means to maintain a productive relationship between accomplishing any single goal and the entire set of goals.
- Sustaining the means to accomplish the set of neuromusculoskeletal and vocal health goals both together, and in relationship to other goals providing energy to the work of the school or department.

- Cultivating the relationship of neuromusculoskeletal and vocal health goals to artistic and educational missions, and to the artistic decision-making authority and responsibilities of individuals and groups.
- Allocating and managing time, schedules, and sequences associated with various neuromusculoskeletal and vocal health efforts.
- Engaging personnel within the school and maintaining liaisons with local professionals and groups, including the development of teams for specific projects.
- Building a culture of cooperation and common effort, based in part on maintaining clarity about specific roles and relationships among issues, specific efforts, and personnel.
- Establishing effective means for evaluating the effectiveness of the local neuromusculoskeletal health plan and using results and analyses to improve the plan.

Resources – Information and Research

NASM-PAMA Resource Documents and Orientation Materials

Information and Recommendations for Faculty and Staff in Schools of Music

Protect Your Neuromusculoskeletal and Vocal Health Every Day: Information and Recommendations for Student Musicians

A Sample Order and Script for Music Student Orientation

Standard Version

Version for Customization

Student Text Version of the Orientation Script

Standard Version

Version for Customization

Protecting Your Neuromusculoskeletal Health: Student Information Sheet

Standard Version

Version for Customization

Protecting Your Vocal Health: Student Information Sheet

Standard Version

Version for Customization

Neuromusculoskeletal and Vocal Health Project Partners

National Association of School of Music (NASM)

<http://nasm.arts-accredit.org/>

Performing Arts Medicine Association (PAMA)

<http://www.artsmed.org/index.html>

PAMA Bibliography (search tool)

<http://www.artsmed.org/bibliography.html>

Medical Organizations Focused on Neuromusculoskeletal and Vocal Health

American Academy of Neurology

(<http://www.aan.com>)

American Academy of Orthopaedic Surgeons

(<http://www.aaos.org>)

American Academy of Otolaryngology – Head and Neck Surgery

(<http://www.entnet.org>)

American Academy of Physical Medicine and Rehabilitation

(<http://www.aapmr.org>)

American Association for Hand Surgery
(<http://www.handsurgery.org>)

American Laryngological Association
(<http://www.alahns.org>)

The American Occupational Therapy Association, Inc.
(www.aota.org)

American Psychiatric Association
(www.psych.org)

American Psychological Association
(www.apa.org)

American Physical Therapy Association
(<http://www.apta.org>)

American Society for Surgery of the Hand
(www.assh.org)

American Speech-Language-Hearing Association
(<http://www.asha.org>)

National Center for Complementary and Alternative Medicine
(<http://nccam.nih.gov>)

Other Resources on Neuromusculoskeletal and Vocal Health

Athletes and the Arts
(<http://athletesandthearts.com>)

National Association of Teachers of Singing
(<http://www.nats.org>)