
TWELVE-TONE PERFORMANCE EXPOSURE THERAPY PROGRAM

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The above references (PAMA/NASM and Sound Practice Handbook) can be viewed below.

Psychological Health in Schools of Music

State of the Art Reviews (StARs)

PAMA/NASM Task Force

Introduction and Background

This is the third in a series of PAMA/NASM collaborations focused on the prevention of health problems in schools of music. The first was directed to Hearing Health, the second to Neuromusculoskeletal and Vocal Health and the third on the issues of Psychological Health.

The goal of the PAMA Task Force is to create an evidence-based reference document for NASM leading to guidelines created by NASM to assist in the implementation of interventions directed at the prevention of health problems in music schools and for accreditation purposes.

The collection has been written by invited PAMA experts with the perspective of providing a state of the art review of the evidence of current knowledge in the broad and immense field of psychological health and distil key concepts essential for NASM pedagogues and administrators.

The following reviews have been written by a team of experts in Performing Arts Medicine with knowledge and experience in psychological health and reflect the complexity of each author's background and points of view to the goals of the PAMA/NASM collaboration.

Each of the StARs were submitted to the co-chairs of the Task Force Drs John Chong and Bonnie Robson who were chosen by the PAMA leadership to coordinate and direct the collective effort and to take responsibility for the organizational interface.

John Chong – Neurobiology of Stress

Bonnie Robson –Perfectionism

John McMillan – Boundaries

Jennie Morton – Impact of Physical Injuries

Patrick Gannon – Performance Anxiety Parts 1 & 2

Kathline Colvin – Bipolar Disorder

Susan Raeburn – Addiction

Vanessa Cornett – Mindfulness Practice

Ralph Manchester – Student Health Services

NEUROBIOLOGY OF STRESS

A 12 Step Approach

State of the Art Review

PAMA/NASM Task Force on Psychological Health

John Chong MD FRCPC

Introduction

This paper will review scientific evidence essential for music students and educators to integrate into curricula and policy for psychological health. The Performing Arts Medicine Association dedicated to improving the well-being of performing artists began in the 1983 and now has grown as a multi-disciplinary organization internationally including physicians, audiologists, psychologists, therapists, performers, educators, researchers, and administrators. The collaboration with the National Association of Schools of Music has already covered Hearing Health, Neuromusculoskeletal and Vocal Health, and now embarks on a collaborative journey in Psychological Health. This series of State of the Art Reviews (StARs) will provide a body of evidence upon which to create guidelines for accreditation in music education and to generate powerful action at local educational institutions.

1. New Frontier of Neurobiological Evidence – Brave New World

Doidge (2007) (1), in his book “the Brain that Changes Itself”, made popular the concept of neuroplasticity, that is the nervous system is changeable, malleable, or modifiable and has recently further explored this concept in “the Brain’s Way of Healing” (2015) (2). However, when confronted by the extraordinary rates of injury among musicians as published by Ackermann (2012) (3), for example in professional orchestras an 84% lifetime prevalence and 50/50 chance of playing hurt, psychological as well as physical risk factors urgently need to be targeted for risk reduction strategies especially early in musical training. With the refinement of neural imaging and other technology a growing body of evidence can lead to a greater understanding of the risks to psychological health and interventions to treat or prevent adverse psychological health outcomes. Chong (2015) (4) reviewed the experience of the Musicians’ Clinics of Canada created in 1986 at the request of the Organization of Canadian Symphony Musicians and the application of this neurobiological evidence to clinical and educational settings. The Artists’ Psychophysiology and Ergonomic Laboratory (APELab) has been constructed to evaluate treatment interventions in ongoing n-of-1 clinical trials.

2. Neural Networks of Musical Performance – Singing in the Brain

Many neurological aspects of music making and listening have been outlined in the writings of Jourdain (1997) (5), Levitin (2006) (6), and Sacks (2007) (7) exploring the underlying biological structures involved in the neural processing of music. Schlaug (2001) (8) has studied the effect of musical training on the auditory-motor tract called the arcuate fasciculus and shows that the musician has a larger tract in both hemispheres than in the non-musician. Zatorre’s group (2009) (9) studied the effects of music on the dopamine binding in the caudate and ventral striatum demonstrating anticipation and experience temporal responses implicated in movement and pleasure. Altenmuller (2010) (10), however, describes the dark side of the increasing specialization and prolonged training in musicians that could result in loss of control and degradation of skilled movement known as focal dystonia. Musical performance continues to be studied, for example, how the activation of the brain networks involved in reward, emotion, and motivation mediates powerful effects on neuroplasticity. Understanding how psychological factors such

as anxiety and perfectionist tendencies are implicated in the development of motor control problems is an area of priority research. An excellent example of these concepts can be seen in the documentary “Two Hands” where Leon Fleisher (2006) (11) describes in intimate detail the stress of the life of a concert pianist and then his struggles with focal dystonia.

3. What Fires Together Gets Wired Together – Monkey See Monkey Do

Coyle (2009) (12) in the Talent Code identifies three key elements to develop optimal performance – deep practice, ignition, and master coaching by the myelination of neural networks increasing speed and accuracy of movements and thoughts. He describes three rules of deep practice - Rule One: Chunk It Up; Rule Two: Repeat It; and Rule Three: Learn to Feel It. Wolff (1892) (13) stated that the body will adapt to demands or shed, the “use it or lose it” principle. Hebb (1949) (14) stated that “when an axon of cell A is near enough to cell B and repeatedly or persistently takes part in firing it, some growth process or metabolic change takes place in one or both cells such that A’s efficiency, as one of the cells firing B, is increased” or more simply stated “cells that fire together, get wired together”. But then the phenomenon called “mirror neurons” was accidentally discovered while studying the grasping movement of a monkey, which has led researchers such as Iacoboni (2009) (15) to explore this in social environments and culture. Theorell (2015) (16) in a systematic review of 59 studies of work and depressive symptoms found that there was moderately strong evidence for high psychological demands, low decision latitude, and bullying as having significant impact on the development of depressive symptoms. Lesser evidence was shown for psychological demands, effort reward imbalance, low support, unfavorable social climate, lack of work justice, conflicts, limited skill discretion, job insecurity, and long working hours. The juxtaposition of this evidence creates a construct upon which music educators can develop pedagogical environments that foster musical performance excellence or the contrary, high risk environments for injury and illness.

4. Mind-Body Connection- When the Body Says No

Mate (2003) (17) in “When the Body Says No – the Cost of Hidden Stress” comes to the following conclusions: 1) Who gets ill and who does not are not random acts of fate, but very much related to our social and emotional lives; 2) Contrary to mainstream medical practice, both ancient wisdom and modern science tell us the mind and body cannot be separated nor can individual humans be separated from their psychological and social relationships; 3) Understanding these unities helps us to maintain or to regain health; and 4) Authentic self-expression is the key--including but not limited to artistic self-expression. Stress is a major factor in the onset of all chronic illness having its origins in emotions resulting in measurable physical events in the body involving the brain, hormone, immune and other physiological systems. The cumulative experience of adverse childhood, educational, occupational, and personal events creates a chronic stress response that may lead to health effects such as heart disease, stroke, diabetes, cancer, arthritis, multiple sclerosis, and dementia. Felitti (1998) (18) found that the number of Adverse Childhood Experiences (ACEs) in a study of over 17,000 individuals was strongly associated with adulthood high-risk health behaviors such as smoking, alcohol and drug abuse, promiscuity, and severe obesity, and correlated with ill-health including depression, heart disease, cancer, chronic lung disease and shortened lifespan. Compared to an ACE score of zero, having four adverse childhood experiences was associated with a seven-fold increase in alcoholism, a doubling of risk of being diagnosed with cancer, and a four-fold increase in emphysema; an ACE score above six was associated with a 30-fold increase in attempted suicide. What neurobiological mechanisms could explain such a strong dose response relationship?

5. Homeostasis, Allostasis, and Allostatic Overload – Stuck On No Off

Selye (1956) (19) was the first to demonstrate the existence of biological stress building upon the ideas of Bernard and Cannon's "homeostasis" into the "general adaptation syndrome" whereby the body copes with stress by activating the hypothalamic-pituitary-adrenal axis (HPA axis) system and then recovers,

which can be remembered by the song “What Goes Up Must Come Down”. McEwen (1998) (20) went further to show that in the face of stressful situations and stimuli, activation of neural, neuroendocrine and neuroendocrine-immune mechanisms occurred. This adaptation has been called "allostasis" or maintaining stability through change through hormonal mediators of the stress response, cortisol and epinephrine or adrenaline. However, when the stress is chronic over a long time period the resulting “allostatic overload” accelerates disease processes by chemical imbalances in the autonomic nervous system, central nervous system, neuroendocrine, and immune systems, which can be remembered by the song “Up Up and Away”. Four conditions that lead to allostatic overload are: 1) Repeated frequency of stress responses to multiple novel stressors; 2) Failure to habituate to repeated stressors of the same kind; 3) Failure to turn off each stress response in a timely manner due to delayed shut down; and 4) Inadequate response that leads to compensatory hyperactivity of other mediators. Sapolsky (2008) (21) in the documentary “Stress – Portrait of a Killer” elegantly reviews the effects of allostatic overload and implications for long term health from prolonged exposure to the stress hormone cortisol where inequalities of rank exist in hierarchical social and environmental structures. What could protect or harm musicians from the effects of chronic stress?

6. What Happens to the Vagus Stays in the Vagus - Curious George?

Porges (2011) (22) explores in the “Polyvagal Theory” the regulation of the autonomic nervous system. This theory outlines the structure and function of the two distinct branches of the vagus nerve that originates in the medulla both of which are inhibitory in nature via the parasympathetic nervous system (PNS). The vagal system is in opposition to the sympathetic-adrenal “fight or flight” system, which is involved in mobilization of the defense survival response. The dorsal branch of the vagus originates in the dorsal motor nucleus and is considered the older branch. This branch is also known as the “vegetative vagus” because it is associated with primal survival strategies such as freezing when threatened, conserving metabolic resources. The Dorsal Vagal Complex (DVC) provides primary control of subdiaphragmatic visceral organs and maintains regulation of the digestive processes. The Ventral Vagal Complex (VVC) or Social Engagement System is more sophisticated to modulate behavioral and affective responses to increasingly stressful environments. This branch is also known as the “smart vagus” because it is associated with the regulation of sympathetic nervous system or “fight or flight” system. This VVC regulates the defense survival circuits and provides primary control of supradiaphragmatic visceral organs, such as the esophagus, bronchi, pharynx, and larynx and the heart. When vagal tone to the heart is high the vagus acts as a restraint or brake limiting heart rate however when vagal tone is low there is less inhibition to the mobilization of the “fight or flight” response. Since the vagus (known in the Musicians’ Clinic as “Curious George”) plays such an integral role in the PNS by the regulation of heart rate, the amplitude of respiratory sinus arrhythmia (RSA) is a good index of PNS activity to see how the vagus modulates heart rate activity in response to stress. This creates psychophysiological intervention strategies that could have an enormous potential to protect musicians from the effects of chronic stress.

7. Stress-Pain-Inflammation-Depression-Disease Connection - Three Stooges Gone Wild

The high rates of injuries amongst musicians have been largely documented by measures of playing-related musculoskeletal disorders (PRMDs) as described in the systematic review of incidence and prevalence by Zaza (1998) (23) leading to the widely held belief that ergonomic interventions such as postural correction and modification of technique could reduce the risk of injury. However, Gevirtz (2006) (24) proposed that sympathetic nervous system (SNS) innervated muscle spindles connects musculoskeletal system to the story of defense survival “fight or flight” responses resulting in myofascial pain and muscle tension. The possibility that there are more than biomechanical risk factors involved in the mechanism of injuries must be considered to provide a comprehensive model for diagnosis, treatment, and prevention. Miller (2009) (25) reviewed the role of inflammation on psychological health problems such as depression (MDD) and as a common mechanism of disease with elevation of inflammatory

cytokine production. This elevated production has been linked back to the excitotoxicity of the chronic stress hormone cortisol on the glial cells which are the “glue” of the nervous system responsible for support of the neural networks, process of myelination, and neuro-regulation of the immune system. There are three types of glial cells: 1) astrocytes; 2) oligodendrocytes; and 3) microglia, the latter most responsible for regulation of immune function, therefore the Three Stooges analogy, but that is where the humor stops. Under chronic stress activation the psychopathological process leads to major adverse health consequences and most importantly chronic pain as reviewed by Milligan (2009) (26). Loggia (2015) (27) demonstrated the elevation of a marker of glial activation in patients with chronic low back pain compared to controls which heralds a new era in the study of the pathophysiology and treatment of pain and depression. Kenny (2013) (28) in the Australian professional orchestra study found a complex relationship between severity of performance-related musculoskeletal pain (PRMD) and depression. In three clusters there was an association between pain and depression however the fourth cluster denied depression but had the most severe pain suggesting somatization of their psychological distress. As well there was a strong relationship between PRMD severity and music performance anxiety (MPA). These findings are indeed profound and highlights the need to reduce the stress of musical performance beginning as early as possible in music education. Also this evidence points to new psychological and pharmacological targets to ameliorate the effects of chronic stress.

8. Targeted Humiliating Criticism - Whiplash

Slavich (2014) (29) proposes a “social signal transduction theory” of depression whereby situations involving social threat are represented in the central nervous system such as the anterior insula and dorsal anterior cingulate cortex (dACC) which processes experiences of negative affect and distress. These connect to lower level sub-cortical structures such as the hypothalamus and brainstem which influence systemic inflammation by modulating the activity of the HPA axis and SNS increasing production of proinflammatory cytokines and inflammatory responses. Major life stressors especially involving interpersonal stress and social rejection are among the strongest risk factors for depression that elicit profound changes in behavior including depressive symptoms such as sad mood, anhedonia, fatigue, psychomotor retardation, and socio-behavioural withdrawal. The risk to health from adverse cortisol effects from psychologically traumatic events is 22 times, equivalent to the health risks from tobacco and asbestos. Lanius (2010)(30) in the text “The Impact of Early Life Trauma on Health and Disease – The Hidden Epidemic” comprehensively examines various aspects of the issue. The connection of parental verbal anger and peer verbal bullying is associated with cortical and sub-cortical structural abnormalities in the arcuate fasciculus, cingulate, fornix, insula, and superior temporal gyrus shown by diffusion tensor imaging. Offord (1989) (31) constructed the Ontario Child Health Study which has yielded epidemiological evidence significantly influencing health care systems and policy makers. The American Academy of Pediatrics (2012)(32) issued a policy statement stating that psychological maltreatment is as harmful as physical assault and includes spurning, terrorizing, isolating, exploiting, corrupting, denying emotional responsiveness, and mental health/medical/educational neglect. The film *Whiplash* (2014) (33) written and produced by Damien Chazelle portrays a first year university jazz drumming student subjected to traumatic stress and abuse by the conductor and teacher. This film graphically illustrates the connection to the above evidence in music education and the need to establish policies on healthy boundaries.

9. Biological Aging - Gang of Four Telotubbies

Epel (2004) (34) studied the effect of chronic stress in a group of mothers of handicapped children and found that psychological elements such as 1) seeing red; 2) rumination; 3) threat to ego; and 4) negative mind wandering, known as the Gang of Four Telotubbies, shortened telomere length by a factor of one year of chronic stress equaled six years of biological aging. Telomere length, a measure of cellular aging is regulated by the enzyme telomerase and Blackburn (2009) (35) received the Nobel Prize in Medicine for this research on telomeres. Ornish (2013) (36) found that comprehensive lifestyle changes such as

diet, exercise, stress management, and social support increased telomere length in a group of men with early prostate cancer. The same intervention program has been found effective at reversing heart disease. Now much interest in the emerging field of integrative medicine has focussed on the evaluation of anti-inflammatory diets, development of exercise programs to increase core stability and cardiovascular fitness, the widespread acceptance of mindfulness-based meditation and yoga, and attention to healthy boundaries in interpersonal relationships. If these types of integrative medicine programs with an increased awareness on health and wellness were implemented on a large scale basis in music education, a significant positive health impact could be achieved, including eradication of the dreaded Gang of Four Telotubbies within the minds and bodies of music students under chronic stress.

10. Anxious to Make It Not Break It – One Wrong Note You Die?

Solovitch (2015) (37), in a heartfelt account of her story “Playing Scared” as a gifted pianist struggling with music performance anxiety (MPA), underscores the need to recognize and treat psychological health problems early to prevent dropping out of music education and to suffer a lifelong loss of the pleasure to perform music in public. LeDoux (2015) (38), one of the foremost researchers in psychological health has put forward the premise that fear and anxiety are not innate states waiting to be unleashed from the brain in response to threatening stimuli but instead experiences that are assembled cognitively from the psychophysiological responses of the body. This has enormous implications for treatment and prevention in that interventions must address both conscious and underlying unconscious processes of anxiety and harness the powers of neuroplasticity. He posits that feelings and working memory are made from a soup of ingredients including 1) executive function such as attention, monitoring, labeling, and attributing; 2) memory including semantic, episodic, autobiographical, and implicit; 3) body response feedback including behavioral and physiological; 4) brain arousal; 5) survival circuit activity; and 6) sensory processing. The driving force of defensive responses and supporting physiological responses in the brain and body is the amygdala which accelerates the response and the ventromedial prefrontal cortex (VMPFC) is the brake on these responses. By understanding the neural circuitry of threat memories involving the VMPFC, hippocampus and amygdala the conditioning and extinction of defense survival responses becomes possible. The development of extinction techniques to enhance exposure therapy effectiveness will become useful in reducing the chronic stress from musical performance and traumatic events that may occur during the course of music education and competition. How music students at risk from chronic stress will be identified early for these interventions will be an enormous challenge for music educators and administrators.

11. Body Keeps the Score –Healing Journey

Van der Kolk (2014) (39) in the most comprehensive text to date “The Body Keeps the Score” reviews some of the neurobiological evidence in treating trauma survivors from combat veterans, victims of accidents and crimes, those touched by the hidden toll of sexual and family violence, and communities and schools devastated by abuse, neglect, and addiction. Crucial in the healing from trauma is the presence of safe and secure attachments mediated by oxytocin and the provision of treatments based on restoring the capacity the body and mind to self-regulate. Interventions such as cognitive behavioural therapy (CBT) contrasts with eye movement desensitization and reprogramming (EMDR) however the power of yoga shows enormous promise as a treatment as well as modality to prevent the deleterious effects of chronic stress and improve resilience. The possibility biofeedback interventions including surface electromyography (sEMG), heart rate variability, and neurofeedback will form the foundation for trauma treatment will become a real possibility in the future. Ogden (2006) (40) similarly reviews the neurobiological evidence upon which to design a treatment approach based on sensorimotor techniques to down regulate defense survival responses and up regulate neural networks to create safety and integration of somatic stabilization with self and attuned relationships. Siegel (2007) (41) has been enormously influential in creating “interpersonal neurobiology”, a framework for maintaining mental health and well-being by promoting secure attachment, mindfulness meditation, and effective psychotherapy. Ongoing

trials of various forms of meditation as described by Epel (2009) (42) may provide evidence of slowing the rate of cellular aging. Given that effective treatments are available based on these neurobiological mechanisms what are the implications for music educators and administrators to design referral systems to identify music students at risk and provide access to interventions for healing?

12. Tuning the Music Education Environment – Creating Resilience

Williamon (2004) (43) in “Musical Excellence” reviews some ground rules for achieving musical excellence, examines effective and efficient practice methods, and then introduces methods for enhancing musical achievement. While the goal of music education is to optimize strategies to maximize performance reducing the risks of illness and injury are of paramount importance. Some of the techniques such as physical fitness, Alexander technique, biofeedback and neurofeedback, mental skills training, cognitive feedback may have some benefit to enhance resilience of the music student under chronic stress however more needs to be done to identify those at risk and access treatment. Kenny (2011) (44) comprehensively examines music performance anxiety with various conceptualizations of the problem and goes on to examine various treatment approaches. Although there may be effective treatments for MPA those students at risk must be identified early and have access to effective and efficient treatment modalities. Morton (2015) (45) in “The Authentic Performer – Wearing a Mask and the Effect on Health” examines the connection between authenticity and health, being an authentic performer, perseverance or abuse in training, and the relationship between body language and creating balance with authenticity which are germane to creating safe environment in performing arts education as well as pursuing artistic excellence. The US Preventive Services Task Force (2016) (46) has released recommendations on the benefits and harms of screening for depression. Screening should be implemented with adequate systems in place to ensure accurate diagnosis, effective treatment, and appropriate follow-up. Tuning the music education environment to listen for both physical and psychological health problems will require the education of students and faculty in these issues and create a conversation of what methodology could be implemented to address the early recognition of music students at risk.

Conclusion

This State of the Art Review on the Neurobiological Effects of Stress – A 12 Step Approach provides strong evidence for music education institutions to implement 1) primary prevention strategies to educate music students and faculty about the psychological health risks in music education and implement mandatory stress reduction interventions; 2) secondary prevention strategies to create systems for early detection such as screening for psychological health problems among music students especially those at risk; and 3) tertiary prevention strategies in order to provide access to effective and efficient treatment of psychological health problems among music students. The collective contributions from the PAMA/NASM Task Force on Psychological Health will further elucidate issues of key importance and provide more evidence relevant to effect change to protect the psychological health of music students.

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PERFECTIONISM

State of the Art Review

PAMA/NASM Task Force on Psychological Health

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Introduction

The search for perfectionism and competition are traditionally part of music training. Perfectionism is endemic in the other arts and sports as well. In sport it is often referred to as pursuits of excellence whereas in music it is more likely referred to as search for perfection if we are to judge by the number of titles on education articles, research and biographies in the arts and media reports that use perfectionism in the title. (Kogan 1987, Brandfonbrener 1988, Robson 1991, Nagel 1998, Bolt JM 2001, Bishop-Gwyn 2012, Nordin-Bates 2014) Alice Brandfonbrener, founding president of the performing arts medicine association and editor of the journal of that organization for many years, in her 1988 editorial, "The Price of Perfection", says she believes that one of the most crucial components of stress for the artist is "the pursuit of perfection". "From the earliest moment when a child picks up a musical instrument there is an unyielding standard established and with it an implied prohibition of error." Music studies take place in a subculture in which members maintain a disciplined way of life involving extreme commitment to training for the primary purpose of reaching a level of perfection in a specific endeavour. Under what circumstances does the striving for excellence become a debilitating perfectionism? How do musicians manage these perfectionistic tendencies that may lead to more serious self-destructive behaviours Nagel notes that "the quest for perfection may be a factor in many stress-related medical disorders.(Nagel 1988)

Definition of Perfectionism

Is perfectionism a psychological phenomenon or a personality trait. The term the pursuit of excellence is more commonly used in sport. This clearly differentiates between a healthy pursuit and a debilitating quest for perfection. Perfectionism has been defined as setting excessively high performance standards in conjunction with a tendency to make themselves and others. (Mainwaring 2009) Perfectionism is usually divided into two distinct entities: Positive perfectionism also called Normal or Facilitating or excellence; and Negative perfectionism also called neurotic, debilitating. In the latter, no matter how well the musician performs he or she is not satisfied with the results; whereas the musician with facilitating perfectionism takes genuine pleasure in striving to meet high standards. (Hendlin 1992) Negative perfectionists see the world as all or none and tend to ignore accomplishments or devalue them. They focus on what they have not yet accomplished rather than their successes. (Barrow and Moore 1983) In her paper on perfectionism compared to excellence Bolt(2001) refers to the work of Hamachek(1978) who regards the "I should feeling" as the most characteristic expression of the perfectionist. For example the individual might say, "I should have worked harder on the dynamics."

The Multidimensional perspective is popular; based on the Multidimensional Perfectionism Scale. (Hewitt and Flett 1991). There are three dimensions: self-oriented, other oriented and socially prescribed. The self-oriented shows excessive striving and demands on self and was coined by Hewitt in 1989. The other-oriented demands perfection from others. These individuals set unrealistic standards for those around them and place importance on others being perfect. They are often hostile towards others and blame critics, Judges and managers. The socially prescribed occurs when the individual misperceives that those around him or her demand perfection. They feel intense pressure to live up to standards of others in society which they perceive to be unrealistic. They have feelings of failure and deep concern for what others in society think of them and place high importance on approval of others. (Bolt 2001p. 18)

Then Hewitt and colleagues developed the Perfectionistic Self-Preservation Scale which is more closely associated with the DSM-5 description of Social Anxiety Disorder or Social Phobia 300.23. This Self-Preservation scale looks at the need to present a flawless image to others (perfectionistic self-promotion) or to hide flaws or mistakes from others (non-display of imperfection) or reluctance to communicate such flaws (non-disclosure of Imperfection). (Hewitt et al 2003) The DSM-5 describes Social Anxiety Disorder as a marked fear or anxiety about one or more social situations in which the individual is exposed to possible scrutiny by others. He or she fears that he or she will act in a way or show anxiety symptoms that will be negatively evaluated and will be humiliating. If the fear is restricted to speaking or performing in public it is described as performance only. Those symptoms associated with Performance only Social Anxiety Disorder are many of the same associated with perfectionism. These are catastrophic thinking, fear of forgetting, fear of criticism or disapproval, distractibility, procrastination, and self-sabotage. (DSM-5 2013)

More recently Nordin-Bates and her colleagues differentiate between perfectionistic strivings and concerns. They note that Stoeber (2011) first used this distinction. Strivings mean aspects of perfectionism “that reflect the pursuit of perfection and setting of exceedingly high standards. Perfectionistic concerns capture aspects of perfectionism that reflect concerns over performance, evaluative fears about others and negative reactions to imperfection. (Nordin-Bates 2014p. 382)

Development Theory

First born and only children are more likely to have perfectionistic tendencies. (Burns 1980, Hendlin 1993) Parents’ self-esteem may be linked to the child success in sport or the arts. Burns (1980) suggests that socialization at home is a contributing factor in the development of perfectionistic personality. Further he says the parents are perfectionistic as well. The parents’ self-esteem is linked to the child’s success as the parent feels that if the child fails it is a reflection of their own poor parenting skills. (Burns, 1980) Perfectionistic behavior promoted in early family socialization may be maintained by cultural influences in adulthood with such common sayings as: the perfect body, practice makes perfect, dress for success. These sayings confirm the individual’s cognitive distortions.

World class pianists experienced competition in the middle years of high school and this promoted perfectionistic strivings. As they grew older they were often enrolled in a professional school with further competition. (Bloom 1985)

Extrinsic Factors

Learning Environment: Nordin-Bates and colleagues have been researching perfectionism and the motivation climate since 2011. Recently they have linked perfectionism to the individual’s perception of their learning environment. They report on two types of learning environment a task involving climate promotes individual learning and everyone is of equal value. It is a co-operative and collaborative environment. An ego involving climate promotes negative comparison, Objective success, rivalry; competitiveness, and punishment for mistakes. This work was done with young elite dancers and they were followed over time so that the authors were able to say “that perfectionistic concerns led to increased perceptions of an ego-involving climate and a decreased perception of a task-involving climate over time. In addition, perceptions of a task-involving climate led to increased perfectionistic strivings over time.” In discussion they suggest that the perfectionistic concerns change the dancer’s perception and she sees her studio and performance expectations as high where mistakes are unacceptable. Further if the training environment is task-involving with emphasis on process, this fosters striving for excellence “without promoting excessive concerns regarding their attainment,” (Nordin-Bates 2014p.382) If competition is promoted in a learning environment it too can lead to unhealthy rivalry. In many elite conservatories competition is accepted and the culture extends over to rivalry between teachers to see if

their students win in the competition. This reflects well on them and they are more in demand. (Robson 1991, Kogan 1987)

deNelsky's perspective is one of learned attitudes and traits which is important as this theory destigmatizes perfectionism. He says that: 1) Much early reinforcement for outstanding performance leads to 2) performance becoming a major base for self-esteem. As the music student grows there is 3) increased competition which offers fewer rewards and can lead to negative behaviors as noted above. 4) After the performance the student gets notes from the adjudicator or teacher. These notes are often critical or can be viewed as such. The music student comes to believe in a perfect performance and has perfection as a goal. (deNelsky 1987)

The learning environment is biased to promote concern over mistakes. Carr and Wyon (2003) note that prolonged training in a social environment where mistakes are noted and outstanding performers are valued sets the stage for expectation of perfection. It is how one practices that counts. Malcolm Gladwell accepts the 10,000 hour rule that it takes 10,000 hours to become a professional. However, he notes that deliberate practice described by Ericsson is also required. Deliberate practice is a regime of effortful activities designed to optimize improvement. Self-criticism is essential to this task as is goal setting. It is easy to see how the student can shift from task focus to self or ego oriented attitude. (Robson 2013, Ericsson et al 1993, Carr & Wyon 2003, Gladwell 2008)

Psychoanalytic Theory

Kenny reports on the work of McWilliams (1994) that perfectionistic strivings can be viewed as a psychological defense against feelings that one is defective. When the musician sets unrealistic goals and they are not attained the person feels flawed and is highly self-critical. Hendlin describes the "perfectionism trap" that begins in infancy. Early they learn to gain attention and by school age know that good work is admired and imperfect work may be criticized. Those that continue to be admired for their performance by adolescence may have difficulty separating themselves from their work. The 'never enough' mentality can be entrenched if the parents also idealize perfection. (Hendlin 1992)

Impact

Dianna Kenny says "Perfectionism, although not extensively studied in the performing arts appears to be both an etiological and maintaining factor in anxious performance." (Kenny 2011 p.10) She reports on two studies of relation of perfectionism to anxiety. A study of high school athletes found that those who were extreme perfectionists were attempting to protect their low self-esteem rather than achieve mastery. (Hall, Kerr Matthews 1998) Art students viewed themselves as more anxious and perfectionistic than regular academic students and worried about their capabilities compared with their arts student peers. (Robson and Gitev 1990) For Musicians, high personal standards of perfection, social standards of perfection and low personal control, was associated with more debilitating performance anxiety, somatic anxiety and less goal satisfaction. (Mor, Day, Flett and Hewitt 1995) The diagnosis of Social Phobia/Social Anxiety 300.23 DSM-5 has not shown a strong correlation with individuals with high perfectionistic standards. Kenny writes that Aiden et al have explained this as socially anxious individuals are more likely to perceive themselves as falling short of others expectations rather than expecting to achieve. However maladaptive perfectionism is associated with social anxiety. She notes that "there is growing evidence----- that many socially anxious people may be perfectionists and that their high performance standards and concern with mistakes contribute to their social distress and self-criticism. (Kenny 2011p. 75)

Toby Diamond describes how perfectionism is often linked to performance anxiety. She says, "The disorder involves too much focus on the self or 'I' and an excessive concern with how one is being perceived." (Diamond 2007)

Similarly Flett and Hewitt (2002) found that maladaptive perfectionism is related to social anxiety, trait anxiety and worry. Further they note that the trait of perfectionism has a paradoxical effect in that those with high perfectionistic tendencies those who are preoccupied with attaining perfection in their performance may actually be more vulnerable to impaired performance. And reminiscent of the Yerkes Dodson (1908) inverted U principle in that performance is enhanced by arousal up to a point and beyond this it causes deterioration. So perfectionistic behaviour can have a debilitating effect on performance or can be facilitating. (Hamachek 1978) This researcher also notes that the “I should feeling” is associated with depression, shame, guilt, face saving behavior, shyness and procrastination. Others add the fear of failure, the inability to make decisions, debilitating procrastination, self-doubt and the stifling of creativity. (Mor et al 1992, Hendlin 1992)

Eating disorders and perfectionistic standards have been anecdotally noted in dancers and athletes in the aesthetics sports. Perfectionism leads to body image dissatisfaction and to avoidance of social situations that focus on appearance. (Hewitt, Flett & Edger 1995) A recent study has confirmed that self-evaluative perfectionism (self-criticism) predicted eating psychopathology. (Goodwin et al 2014). Cena ,working with dancer and elite athletes found that a high level of maladaptive perfectionism in dancers had a strong an effect on perfectionistic tendencies but that the link to a concern about the body aesthetic was not as strong as expected. This seems to indicate that although artists such as dancer may have a higher perfectionistic attitude than athletes it is not directly related to eating disorders.

Summary

Following from these studies perfectionistic strivings are positive in an environment leading to task attainment. However when excessive perfectionism or maladaptive develops as a result of environmental stressors, individual development and training experiences then the individual is at risk for low self-image, feelings of worthlessness, depression and in some instances anxiety as well as social phobia. When training is focused on the task, even if a high goal is set, instead of on the performance then the individual grows with a positive outlook. The secure individual is eager to take on new challenges. This means that parents, teachers and coaches who want to foster successful musicians need to be aware of the pitfalls of seeking perfection especially an overly self-critical attitude and basing success on a demand for perfection.

In the highly competitive professionally oriented music environment a student artist may adopt a win/lose perspective and an ego oriented position. Prolonged repetition with a self-oriented perspective puts students at risk for psychological and musculoskeletal injury. Students with achievable goals are more likely to succeed than those focused on comparing themselves to others. A task oriented training environment with emphasis on task achievement is to be recommended with deliberate mindful practice and attainable goals. By addressing any potentially unhealthy perfectionistic thinking patterns early in a career one may prevent more serious disorders as performance anxiety, depression, eating disorders and even suicide. (Bolt 2001).

Perhaps the area of education and prevention is best summarized by Nagel (1998): “the progression from talented child to fulfilled professional is beset with obstacles other than playing an instrument with facility.-----It is not surprising that the pursuit of ‘perfection’ sets the stage for musical, mental and medical maladies.” The research gives clear direction for change and prevention of the more serious psychological disorders. Early education must foster task oriented, co-operative and collaborative learning to avoid the development of negative perfectionistic attitudes.

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BOUNDARIES IN SCHOOLS OF MUSIC
An introduction to key concepts and recommendations for policy makers

State of the Art Review

PAMA/NASM Task Force on Psychological Health

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Introduction

Amid the hardworking and well-socialized members of virtually any academic institution, there are those individuals who seem not to be bound by the basic respect for rights and freedoms of others that most of us take for granted. They are referred to behind their backs as “That guy,” or “Oh... *her*.” Or worse. Stories may circulate about them, about the awful things they’ve done and gotten away with. They create havoc and unrest wherever they go, and destabilize the learning environment for all.

It is in the interest of minimizing the negative impact of such individuals that policy documents outlining appropriate roles and boundaries must be created. The following is intended as a point of departure for writing or rewriting such policy documents. To do so requires an author — or, ideally, a committee of authors (Namie and Namie 134) — to anticipate the risks to learners and employees of the institution from bullies and abusers, and to set up protections for vulnerable parties in the form of meaningful, enforceable penalties for policy violators.

Classification of Boundaries

Brown (2006) classifies boundaries into two categories, each of which can be further divided into four types (Brown 45-8). A very brief interpretation follows:

Categories:

- I. **Physical boundaries** are the observable limits of the person in space. These boundaries may extend to property which clearly belongs to that person.
- II. **Psychological boundaries** are the subjective, conceptual limits of the person as determined by himself/herself. These might include concepts of personal/territorial space around the person; material objects where ownership is not clear to all parties; emotional integrity. These arise over time, and are often not conscious to the person until violated — ie. “you’re in my space” — “that’s my seat” — “what you said hurt my feelings.”

Types:

- a. **Flexible** boundaries are generally the healthiest type. The person chooses appropriately which stimuli to let in and which to keep out.
- b. **Soft** boundaries are present when the boundaries of the person are merged with the boundaries of others, such that stimuli are indiscriminately allowed to pass through.
- c. **Rigid** boundaries are present when the person indiscriminately keeps all stimuli out.
- d. **Spongy** boundaries are present when the person has a combination of soft and rigid boundaries, but has no control over which type is engaged for any stimulus.

Boundary Violations

Katherine (1991) identifies two types of boundary violations, introducing the concept of inappropriate distance:

- I. **Violations of intrusion** are interactions in which a boundary is abutted or breached. These can be of a physical nature (eg. unsolicited sexual touching, physical violence, stealing), or of a psychological nature (eg. inappropriate personal questions, unwelcome romantic overtures, belittling, shaming) (Katherine 35).
- II. **Violations of distance** are interactions in which the distance between people is greater than appropriate to the nature of their relationship. These can be of a physical nature (eg. a classmate refuses without cause to do group work in proximity to another student), or a psychological nature (eg. a professor invites all but one of her students to dinner)(Katherine 36).

Bullies and Targets

At the time of this writing, the issue of bullying in society has become especially prominent in the news and in popular culture. There have been high profile news items concerning cyberbullying of teens and young adults leading to suicide (Henderson), workplace bullying leading to suicide and/or homicide (Shear et al), gun violence by previous victims of school bullying (Pankratz), sexual harassment lasting years with minimal or no consequence to the aggressor (Talbot). Additionally, there have been strong campaigns to promote awareness and help put a stop to bullying (stopbullying.gov).

Bullying has been increasingly portrayed in popular culture as well. Of particular interest to people acquainted with schools of music, the film *Whiplash* (2014) depicts a ruthless jazz band instructor named Terence Fletcher, whose repeated boundary violations against talented student Andrew Neiman escalate to a dangerous extreme.

Brown (2006) describes a personality type consistent with the behaviour of Fletcher, which she calls the “destructive narcissist.” She outlines ten characteristics of destructive narcissists (Brown 24-30):

Indifference to others:

Extensions of self and boundaries

Exploitation

Lack of empathy

The inflated self:

Grandiosity

The impoverished self

Attention-seeking

Admiration-seeking

Troubling states:

Shallow emotions

Emptiness

Entitlement

The destructive narcissist sees the entire world purely as an extension of himself/herself. This leads to a lack of recognition of appropriate boundaries, and often results in a trail of disgruntled and damaged people in the narcissist's wake.

Perhaps the most perilous situation arises from the proximity of the destructive narcissist to a person with soft boundaries, such as the Andrew Neiman character in *Whiplash*. Namie and Namie (2011) describe such individuals as "targets." They describe the target's personality as including the following (57-8):

Abhorrence of confrontation

Tendency to remain cooperative even in situations of fierce competition

Openness and guilelessness

Tendency to self-disclose to others

Defiant optimism

Belief in a world that is just and fair

These personalities — bully and target — can be seen to lie at the extremes of a continuum, with most people situated somewhere in between. While it cannot be a goal of institutional policy to re-socialize individuals, it should be seen as being of primary importance to protect people on the target side of the spectrum from those on the destructive narcissist side.

Goals for policy makers concerning boundaries

In constructing a policy regarding the boundaries of individuals within an institution or an organization, the ultimate goal should be to protect people who identify, respect and maintain appropriate boundaries, and to exclude from protection those who don't. Namie and Namie (2011) outline an eight step process to developing such a policy (133-152):

1. Assess the current situation in regards to bullying
2. Create the policy to prevent bullying
3. Develop informal solutions (necessary to give options to targets of bullying beyond formal allegations)
4. Formal enforcement procedures to correct bullying (via fair and credible process)
5. Provide restorative justice
6. Deal with confirmed violators
7. Get the word out (that the culture is changing)
8. Optimize accountability

This process is intended to further the aims of the organization by retaining individuals who respect and maintain appropriate boundaries, and by providing a mechanism for removal of individuals who do not. In so doing, a more favourable environment conducive to good work can be created, absenteeism and disability claims may decrease, and the reputation of the organization as a great place to work (or study) may be propagated.

Namie and Namie (2011) stress that without an explicit policy it becomes easy for the bully to challenge the leadership, and continue bullying with impunity (133). Without a policy, the bully is merely labelled a bully; with a policy in place, the bully becomes a policy violator, and can be dealt with more definitively (3).

Challenges of boundary policy-making in academic institutions of music

Creating a policy document that serves in a real way to protect the boundaries of the people who work and learn in schools of music may be complicated by several factors. To name a few:

Multiple levels of hierarchy — Eg. undergraduate students, graduate students, teaching assistants, junior faculty, senior faculty, office staff, building staff. With more potential power imbalances comes more opportunity for abuse of power.

Unconventional personalities of artists — The case could be made that the destructive narcissist pattern previously mentioned could be used to describe many successful musicians throughout history.

Students at various stage of development — The majority of students entering post-secondary academic institutions are at an age where they may have incompletely developed boundaries.

One-to-one music instruction — Provides a more individualized education, but with potentially less oversight and fewer witnesses to whom to remain accountable.

Creating a successful policy document will require the collective resources of empathy and experience of its writing committee to anticipate situations in which those at risk within the institution can be better protected.

Conclusion

The maintenance of appropriate boundaries is required to learn, teach, and create effectively and sustainably in academe. An academic environment in which certain individuals are permitted to violate boundaries without consequence is likely to fall under the sway of these same individuals, with a negative impact on learning, and at great cost to the reputation of the institution. Without an effective policy on boundaries, any means of addressing such behaviour is toothless; with an effective policy in place, control and ultimately eradication of such behaviour becomes possible.

Despite the challenges, it is in the best interest of concerned educators in schools of music to develop and implement a policy document that includes definitions of roles and boundaries, as well as consequences of non-compliance, in order to foster an environment of optimal creativity and wellness for all.

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THE PSYCHOLOGICAL RELATIONSHIP TO PHYSICAL INJURY

State of the Art Review

PAMA/NASM Task Force on Psychological Health

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It is a commonly accepted phenomenon that a performing artists' personal identity is closely tied to his or her ability to perform: this is not 'what they do' but 'who they are'. Therefore, it is a fairly logical sequelae that when an injury serves to remove the ability to perform, there are likely to be some psychological ramifications. Similarly, if artists are deriving their main income from their craft, then an enforced absence from the workplace can also raise anxiety levels relating to financial stability. Such an increase in anxiety can actually have a direct effect on the levels of pain experienced and therefore the emotional or psychological response to the injury cannot be viewed as a separate entity. Physical and psychological injury are inextricably linked via distinct physiological mechanisms and these are described below.

In order to explore the relationship between anxiety and perceived pain levels, we need first to understand the anatomical and physiological connections through which our psycho-emotional and physical systems integrate. Whilst for many years the mind and body were treated as separate entities by many in the medical field, there is now a proven physiological basis for the integrated nature of mind and body with the growing development of the field of Psychoneuroimmunoendocrinology or the PNI super system¹. This pioneering medical approach connects our psychology or mento-emotional states to our neurological (relating to the nervous system), immune (relating to the body's defences) and endocrine (hormonal or chemical messaging) systems. These systems are all intricately linked, and therefore interdependent, and communicate via electrical and chemical 'cross-talk'². There are some very obvious physiological responses to emotional states that are familiar to everyone - a nervous stomach or "butterflies", the production of tears etc. - but this integration also happens on a much deeper and more subtle basis every day of our lives from infancy through to adulthood. Our biology actually develops in response to our emotional environments from birth and our physiological responses become encoded by this patterning.

When a musician experiences pain or injury then he or she is also likely to experience some associated anxiety related to the aforementioned issues of the potential loss of identity and financial stability. Anxiety is a manifestation of the primal fear response that leads to the chemical cascade associated with the 'fight or flight' mechanism. This cascade, mediated via the PNI system, serves to increase our heart rate and power our muscles to ready us for action. It also heightens all our senses, including our perception of pain, allowing us to be hyper-vigilant to our surroundings. These chemicals are designed to be burnt off during an outburst of energy but, if left latent in the system, can actually have a corrosive effect on the body tissues. Whilst the 'fight or flight' mechanism is a primal instinct designed to be used in times of mortal threat, in the modern world our fear and anxiety are more often triggered by psycho-emotional stressors. However, the body does not discriminate and this can often result in a disproportionate physiological response. When the threat is an emotional one, there is often no opportunity to burn off those chemicals during fight or flight, so they remain in the system and can lead to increased levels of inflammation.

Inflammation is the body's natural response to threat. When a tissue is damaged, the body responds by producing inflammatory chemicals to fight the potential threat and promote healing. These 'threats' can

come in many forms: tissue damage, such as a muscle or tendon strain; an open wound on the skin through which invading microbes may attack; food poisoning where the gut lining becomes the defender of the internal environment. However, such threats may also come in the form of a verbal attack from another person or even the negative ‘self talk’ present in one’s own mind. Whether the attack is physical or emotional, the body does not discriminate and the physiological response is the same.

Whilst the ‘fight or flight’ mechanism is a product of the activation of the sympathetic nervous system (SNS), once the threat has been removed, the parasympathetic nervous system (PSNS) begins to take over and places us into ‘rest and digest’ mode. This is akin to a ‘system reset’ for the body where the chemical environment is neutralised. However, in the case of emotional anxiety, the perceived ‘threat’ can be constant resulting in the SNS-dominant state being maintained for prolonged periods with no opportunity for the neutralising and restorative effects of the PSNS to come into play. As our senses are also heightened in this state, this can have the effect of dialling up the volume on our pain levels. The more pain we experience, the more anxious we tend to feel, which in turn drives up pain levels, so we can find ourselves in a perpetual loop from which it becomes difficult to extricate ourselves. This can mean that the level of pain experienced from a physical injury is actually disproportionate to the actual level of tissue damage. Therefore, any assessment of physical injury needs to be viewed in the context of the person’s current psycho-emotional state.

Musicians injuries are most commonly caused by overuse or overload of a particular body area where an accumulation of tissue damage over time results in pain and dysfunction³. Dr Hans Selye, who devoted his life to the study of the physiology of stress, wrote:

“The human body - like the tires on a car, or the rug on a floor - wears longest where it wears evenly.”⁴

He also warns of the same phenomenon being true of repetitive mental tasks, such as turning the same thought over and over in your mind until it festers, saying that this can be equally as damaging. He continues:

“Nature loves variety... if you use the same parts of your body or mind over and over again, the only means Nature has to force you out of the groove is general (systemic) stress.”⁴ p. 424.

This means that emotional anxiety is not just a feature of the response to physical injury, but it can also be causative of physical symptoms. If many hours are spent in both repetitive physical and mental practice to the point of fatigue, then both can potentially lead to an increased risk of physical injury⁵. Pain is simply the mechanism by which the body can alert us to potential damage and force us to remove ourselves from its path. This could, for instance, manifest as right shoulder pain, telling us to rest that bowing arm, or discomfort in our gut telling us to remove ourselves from a particular person’s presence.

Much of the research literature on stress cites lack of information as a potent stressor to the body⁶. If musicians are unaware of the reasons behind their symptoms, then this can lead to a sense of lacking control, which has been linked to an increased risk of ill health⁷. It can also lead to the notion that the injury is an external threat that is somehow being forced upon them. As we have seen, this is likely to induce anxiety and the concomitant stress cascade. However, in many cases the cause of an injury actually lies in either the technique or training behaviour that results in a particular body tissue reaching its tolerance. Providing education about the types of behaviours that may lead to injury and the role that anxiety can play in exacerbating symptoms will actually serve to engage the musician in the process, allow them to take responsibility for the symptoms, thereby increasing autonomy, and reducing the stress

response. This in turn can serve to reduce pain to a more proportionate level via the mechanisms already discussed.

To be a performing artist arguably requires a degree of creativity and there are several research papers that describe links between creativity and perfectionism, as well as parenting styles^{8,9}. The boundaries of our biological defence mechanisms are formed in response to our emotional environment during childhood, which in turn dictates how we will respond to injury and anxiety. John Bowlby's work on 'Attachment Theory' describes how the emotional or physical unavailability of a parent can lead to the development of a tendency to repress anger and emotions in the child in order to avoid rejection. Such repression can lead towards the anger being directed at the self and may result in inappropriate self criticism and a tendency towards perfectionism¹⁰. The neurologist Stavia Blunt, writing in *Neurology of Music*, actually goes so far as to say that issues such as early parental loss (emotional or actual) and childhood trauma are actually conducive to creativity¹¹. If a child has learnt to repress emotions such as anger and repeatedly turn these inwards, this can result in the immune system mounting an attack not on the external threat, as it should, but on the body's own tissues. Perfectionism is also what may lead musicians to dedicate themselves to hours of repetitive practice, driven by a fear of failure, and also to subject themselves to repetitive negative 'self-talk'. When physical and mental practice are driven by the anxiety of failure, one can see how this will be a recipe for an inflammatory chemical environment within the body tissues.

If a musician has been unable to play for a prolonged period of time due to an injury, then the injury itself may become embedded in his or her personal identity. An enforced absence from the workplace may serve to increase the anxiety surrounding the return to one's craft - doubts over one's fitness or ability and the anticipated response of teachers, colleagues and the wider audience loom large. In such cases, the injury may now come to represent an excuse to fail: "my hand is not strong enough yet", "I am not back to full fitness". Even when the damaged tissue is fully healed, the musician may still experience symptoms driven by the surrounding anxiety as the mind seeks a way to avoid potential failure. That is not to say that such symptoms are 'imagined', they are absolutely real but mediated by psycho-emotional chemistry rather than purely local tissue damage. A situation may also arise where the injured body area becomes a site for the attachment of blame leading to a sense of rejection and therefore disembodiment of the part: "I can't play because of my hand", "my shoulder is stopping me from practising". In this instance, the body part is now being perceived as the external threat and therefore the relationship with it needs to be rebuilt in order for harmony to return. Similarly with instrumental musicians, there can often be a breakdown in the relationship with one's instrument when one is unable to play through injury. Here, the instrument can become the focus of blame as if it had mounted a physical attack on the player and caused the injury and is therefore banished to its case which remains unopened. For some musicians just the thought of opening the case induces a fear response as it begins to represent a 'Pandora's Box' of negative emotions¹².

It is clear then how simply rehabilitating a physical injury may not be enough to allow the musician to return to full practice or performance. Attention must also be given to the psycho-emotional journey which may have contributed to, or provided the context for, the physical injury. Relationships with the injured area, the instrument, the family, teachers, colleagues and wider audience all need to be considered to ensure that the whole picture is being addressed. Providing education that includes all the contributing factors to the development of pain, discomfort and injury will serve to place musicians back in the driving seat of their own destinies, giving them the tools not only to help them manage and cope with such situations, but also to help prevent their occurrence in the first place. Battles (both internal and external) are borne out of fear and a lack of control, but when one has the confidence in one's self and the autonomy to manage one's own destiny then there is no need to fight. When those internal weapons are laid down to rest, then an environment is created where music can be borne from intention not tension.

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MUSIC PERFORMANCE ANXIETY PART ONE: Definitions, Causes, Assessment, Symptom Clusters, Sub-Types and Theoretical Considerations

State of the Art Review

PAMA/NASM Task Force on Psychological Health

Patrick Gannon, PhD, Peak Performance Systems

Introduction

Music performance anxiety (MPA) is a common dilemma for many musicians, professionals and amateurs alike, and impacts performers across all musical genres, ages, genders, instruments, solo and ensemble performers, instrumentalists and vocalists. Famous sufferers include Frederic Chopin, Maria Callas, Vladimir Horowitz, Arthur Rubenstein, Sergei Rachmaninoff, Carly Simon, Barbra Streisand, George Harrison, Janis Joplin and Jimi Hendrix (1).

Prevalence

Clinical anxiety affects some 40% of the general population (39). Performance anxiety affects 2% of the general population but is especially prevalent among performing artists, athletes, test-takers, public speakers and writers (2). Among musicians, past studies have indicated that MPA is widespread (1,3,4). In 1987, the ICSOM survey, based on responses submitted from 48 orchestras, found that 24% of the 2212 musicians reported severe cases of MPA while 13% suffered from lesser forms of anxiety (5). James (6) in a survey of 56 orchestras reported 70% of musicians experienced MPA at a level that affected their performance. More recently, Kenny, Ackermann and Driscoll (7) surveyed 357 musicians from all eight state orchestras in Australia and found that over 40% reported a variety of MPA symptomatology and some 37.3% reported that anxiety interfered with their focus and concentration. Performance anxiety is one of the two most commonly reported problems among musicians (5).

Definitions

There have been several definitions of MPA over the last twenty five years beginning with Salmon (8):

Music performance anxiety is the experience of **persisting, distressful apprehension** and/or actual **impairment of performance skills** in a public context, to a degree unwarranted given the individual's musical aptitude, training and level of preparation.

Kenny (1) has provided an updated definition of MPA that incorporates new clinical findings and broadens the conceptualization of performance anxiety. She cites other sources of performance anxiety outside of the standard state/trait anxiety definition as described by Spielberger (9). Kenny's definition of MPA:

MPA is the experience of marked and persistent **anxious apprehension** related to musical performance that has arisen through underlying **biological** and/or **psychological vulnerabilities** and/or specific **anxiety-conditioning experiences**.

Classification of MPA In DSM-V

With the publication the DSM-V (10), the classification of performance anxiety among the list of anxiety disorders has remained the same, namely, social anxiety disorder. Consideration was given to determining if MPA warranted it's own sub-type or "specifier" which was ultimately denied.

However, reviews of some two dozen studies by Blote et al. (11), Hoffmann et al. (12) and Hook & Valentiner (13) concluded that the evidence does support a qualitatively distinct performance anxiety sub-type. Specifically, they found that performance anxiety has a phobic quality and patients report more fear of panic attacks than fear of negative evaluation. This suggests that physiological reactions are at the heart of MPA.

In support of this thinking, anxiety sensitivity and the fear of hyperarousal, including increased heart rate or muscle tension, was a predictor of performance anxiety. Researchers (11, 12, 13) concluded that MPA has a smaller genetic/familial component, a stronger psychophysiological response to performance situations, and later onset than other sub-types. Interestingly, the authors speculated that past traumatic performance experience is the likely distinguishing factor between MPA and other anxiety disorders.

Assessment of Music Performance Anxiety

As with the evolving definition of MPA, some twenty questionnaires and inventories assessing MPA have been employed in clinical, research and academic settings over the last twenty-five years. Most of them measure state anxiety in response to performance situations. Many of these inventories are iterations of previous scales and not all measure the three primary categories of symptoms (cognitive, behavioral and physiological). This renders them less helpful in clinical settings.

The most recent and comprehensive questionnaire available is Kenny's (14) Music Performance Anxiety Inventory (K-MPAI). The revised 40 item scale reflects a broader conceptualization of MPA and measures other sources of performance anxiety including somatic anxiety, self-other scrutiny (self-consciousness), trait anxiety, depression/hopelessness, attachment and biological vulnerability. The advantage of this scale is that offers a more complete profile of MPA symptomatology that can guide treatment planning. The K-MPAI can also be adapted as a self-scored inventory that musicians can use to inform themselves about their own MPA.

All musicians showing any signs of MPA should be referred for assessment provided by a qualified mental health professional with expertise in anxiety disorder treatment and MPA. It is also recommended that students, teachers, counselors and administrators become familiar with the K-MPAI and use it as a screening tool for MPA. Using the inventory in class settings can open up a dialogue about music performance anxiety. In cases where test scores are high in a particular category, students can ask for referrals and teachers and counselors can recommend treatment. Having adequate referral sources for treatment on hand is essential to promote early detection of mental health and performance issues. In general, more openness to mental health issues is needed to provide a safe and supportive environment for musicians to get the help they need.

Symptoms of Music Performance Anxiety

Anxiety signals fear and fear is the memory of danger. The symptoms of anxiety are a reflection of the profound multi-system arousal that takes place when a real or perceived threat is introduced. These fear memories develop connections with each other and can trigger the body's fight/flight/freeze response. The "freeze" response, overlooked by Walter Cannon in his famous book published back in 1932 (15), is responsible for the commonly cited cognitive symptom of MPA that many musicians dread: fear of memory loss. With repeated triggering of the threat detection system, the fear response can "snowball" into a fixed anxiety disorder (34).

Symptoms of MPA span three broad categories and five sub-categories including: physiological/somatic, affective, cognitive, psychological and behavioral. Performance anxiety checklists include upwards of fifty distinct symptoms that can appear hours, days or weeks prior to a performance. All of these symptoms can manifest with varying intensities. Most performers can identify four or five symptoms that they are most aware of, although upon assessment, they often

identify several more. It can be helpful to note which categories generate the most symptoms. These categories can suggest targets for future treatment interventions.

Below is a list of symptoms by category:

Physiological/Somatic Symptoms

- Muscle tension in the neck, throat and shoulders
- Rapid heart rate
- Trembling
- Shortness of breath, shallow breathing
- Sweating
- Dry mouth
- Nausea
- Dizziness
- Physical rigidity and clumsiness
- Fatigue
- Problems sleeping
- Loss of appetite or emotional overeating
- Digestive problems, stomach aches

Cognitive Symptoms

- Intrusive, repetitive or racing thoughts
- Obsessive worries
- Catastrophic thinking
- Lapses in concentration
- Memory loss and fear of memory loss
- Distractibility
- Negative thoughts about the performance
- Critical thoughts about one self
- All or nothing thinking
- Disqualifying the positive
- Jumping to erroneous conclusions
- Emotional reasoning (feelings dictate what is perceived to be true)

Affective Symptoms

- Anxiety and anxiety sensitivity
- Fear and fear of fear
- Irritability and anger
- Low mood, apathy

- ___ Emotional volatility
- ___ Reactivity to external events
- ___ Shame

Psychological Symptoms

- ___ Feelings of inadequacy
- ___ Fear of disapproval
- ___ Irrational fears about the performance
- ___ Projection of fears onto the audience
- ___ Perfectionism
- ___ Fear/Ambivalence about public attention
- ___ Self-worth tied to performance outcome
- ___ Psychosomatic reactions
- ___ Personalizing (applying negative meanings from external events to oneself)

Behavioral Symptoms

- ___ Avoidance of performing
- ___ Self-sabotage behaviors
- ___ Procrastination
- ___ Behavioral inhibition
- ___ Jumpiness

Sub-Types of Music Performance Anxiety

Based on the traditional conceptualization of MPA as state anxiety, there has been a tendency to view MPA as one type of anxiety disorder most often categorized as “social anxiety” or “social phobia” (10). However, Kenny (1) posits that there are three sub-types of MPA, not one, which suggests that a broadening of our conceptualization of MPA is needed. Other clinicians (16, 17) concur that “one size does not fit all”.

Kenny’s (1) three sub-types of MPA are:

- 1) focal (stand alone) music performance anxiety that is the result of past negative conditioning experiences;
- 2) a more generalized anxiety disorder that includes elements of social anxiety, phobias and obsessive/compulsive disorders;
- 3) a severe and persistent performance anxiety tied to one’s sense of self and self-esteem with symptoms of panic included.

Significantly, these sub-types of MPA appear to be driven by several “sources” or conditions that also generate anxiety that “carry forward” to impact the state anxiety response tied to the performance event. All of these sources contribute to the creation of a symptom profile across the five categories. Personality factors may also influence in how one responds to the pressure of public performance, although reviews of studies do not always support this. Kenny (1) summarizes those

personality features that have been associated with anxiety including neuroticism, introversion, perfectionism and behavioral inhibition.

Causes of Music Performance Anxiety

MPA can occur in a variety of settings but especially those that pose:

- 1) high ego investment (job or competition),
- 2) evaluative threat (audience, judges)
- 3) fear of failure (shame, threats to self-esteem)

For this reason, auditions, competitions and solo performances are the most frequently cited situations that trigger MPA. MPA appears distinct from the occupational stress musicians face owing to erratic work schedules, inconsistent payment and problems in the physical environment. However, occupational stress does affect the performer in a more general way if one's ability to cope with life stress is compromised.

A recent survey of musicians and music students reveal what they perceive as the cause of their performance anxiety. Kenny (1, 15) conducted two studies, one with New Zealand tertiary-level music and dance students and later, with orchestral musicians, identified several causes that offer a deeper understanding of the psychology of MPA that can guide treatment planning.

Below are the top 12 cited causes of MPA in diminishing order of significance. Each of these items can be tied to particular sources of MPA that create the various sub-types identified above:

- Pressure from self
- Not knowing how to manage physical arousal
- Inadequate preparation for performance
- Tendency to be anxious in general, not just performance
- Health issues
- Negative thoughts, worry about performing
- Inadequate support from people close to you
- Excessive physical arousal prior to or during a performance
- Lack of confidence
- Attempting repertoire that is too difficult
- Concern about reliability of memory
- Bad past performance experiences

Reconceptualizing Music Performance Anxiety

Although MPA has traditionally been classified solely as state anxiety, (8), there is growing evidence that this understanding of MPA is too narrow. Observations made in clinical practice (16, 17, 18) plus new research reported by Kenny (1) as well as the latest findings in the fields of neuroscience, trauma (28) and attachment suggest that MPA is a far more complex

psychoneurophysiological condition than simple “stage fright” would suggest. MPA is not just state anxiety but also can include other factors or “sources” of anxiety that interact with the performance situation to generate the diverse symptomatology that is seen in clinical practice. MPA has been found to be both resistant to treatment (19) and vulnerable to relapse (20, 29). An updated conceptualization of what MPA is should lead to more effective treatments.

Brain research has identified the bodily response to real or perceived threat that impacts multiple systems in the body and mind. Significantly, this initial response is unconscious. Research by neuroscientist Joseph LeDoux (21, 22) shows that emotion rules the brain far more than conscious thought. The survival instinct is ALWAYS on alert for new threats even before there is conscious awareness of those threats.

He writes:

“Fear feelings and pounding hearts are both effects caused by the activity of the system, which does its job unconsciously—literally, before we actually know we are in danger. The system that detects danger is the fundamental mechanism of fear, and the behavioral, physiological, and conscious mechanisms are the surface responses it orchestrates.” (pp. 18)

LeDoux (22) found that neural circuits running from the amygdala (limbic system) to the pre-frontal cortex are thicker than in the reverse direction. This challenges the traditional understanding that cognitive appraisal triggers the emotional response. It also implies that trying to down-regulate physiological arousal through conscious mental activity is of limited value.

Neuroscience findings suggest that MPA starts with the sequenced activation of the heart, limbic system and sympathetic nervous system as well as the vagus nerve, peripheral/somatic nervous system and neuroendocrine system. This multi-system arousal triggers a constellation of symptoms that can interfere with several mental functions that are crucial to performance. Conscious awareness of these symptoms can activate a second cycle of escalation and intensity, especially among those who score high in anxiety sensitivity (fear of physiological arousal) (23).

Trauma research reveals that unprocessed anxiety is encoded in the implicit memory system as state dependent learning that is largely unconscious and can be reactivated by any life stress, especially performance (28). Surprisingly, the source of this reactivation is not always known to the person even when they are aware of the anxiety symptom. Studies of trauma treatment (27) have shown that for the anxiety to be neutralized these memories must be first accessed and then “reconsolidated” in a more positive way using trauma techniques that can engage the implicit memory system. If left untreated, the tension between the unprocessed anxiety that attaches itself to the stress of performance can overwhelm a performer’s coping ability under particular circumstances. This may explain why those treated for MPA using CBT only are prone to relapse.

Finally, attachment style also may play a role in determining the intensity of the MPA symptoms (24) and performance success. Gardner and Moore, (25) found that the avoidant coping style that is a component of the avoidant attachment style is more likely to be associated with chronic performance dysfunction. The anxious attachment style is estimated to number 15% of the general population (26) and may be a core component in the more severe and persistent cases of MPA. Ecker, Ticic and Hulley (27) found that attachment quality impacts the degree of integration among brain systems, interpersonal responses, and emotional regulation, all of which are central to musical performance.

It is essential that a comprehensive understanding of MPA incorporate new knowledge from other sub-specialties within the field of psychology, psychotherapy, neurology and psychophysiology. For too long, the treatment of MPA has relied on a symptom-focused approach that was largely borrowed from the field of sport psychology. However, there are significant differences between athletes and musicians who are experiencing performance anxiety. Athletes (including dancers to some extent) can discharge arousal (and thereby lessen anxiety) through the physical exertion

involved in playing their sport. Musicians, on the other hand, must rely on other, less reliable, techniques (primarily autogenic techniques such as diaphragmatic breathing and visualization) to dampen arousal. These techniques may help but are often inadequate to quell the cascade of anxiety symptoms that typically peaks right before stepping on stage. Especially for the classical musician and the solo performer in particular, the margin of error is much narrower than for most athletes who can make several mistakes and still have a chance to make a play to win the game. However, for instrumentalists, vocalists and dancers, performing in competitions and auditions, success is judged by how close the performance comes to absolute perfection across a range of measures.

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MUSIC PERFORMANCE ANXIETY PART TWO: Expanding the Treatment of MPA, Improving Outcomes and Reducing Relapse

State of the Art Review

PAMA/NASM Task Force on Psychological Health

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How is it that music performance anxiety (MPA) remains such an impediment to performance success for so many musicians? Why haven't new treatments been made available that demonstrate more effectiveness in reducing symptoms yielding a positive impact on performance quality? What can music schools and conservatories do to recognize the scope of the problem and meet the need for better services to help their students grow as performers?

The treatment of performance anxiety has not changed much over the last fifty years since the modern era of sport psychology began. After relying primarily on cognitive-behavioral therapy (CBT), mental skill training and medication, the time has come to expand the treatment opportunities to increase therapeutic effectiveness and reduce relapse rates. This paper will provide an overview of the treatment landscape for MPA, identify new treatments that show promise and suggest a multi-modal approach to treatment planning that customizes the treatment to the performer's symptom profile.

The Pros and Cons of Standard Treatments for MPA

Of the three treatments listed above, one can conclude that the most popular, if not the most effective, treatment for MPA, has been "beta-blocker" medication (3). Marketed under the brand name Inderal (generic name is Propranolol), this medication reduces the physiological activation of the heart and lungs. While there are some side effects and contra-indications for musicians with asthma and/or specific heart conditions (especially among seniors), this medication is considered to be both safe and effective in its "off-label" use to treat MPA. However, many musicians are uncomfortable relying on a drug to dampen anxiety. Some report a "dullness" that prevents more inspirational performances. Nevertheless, surveys (4) indicate that upwards of 20% - 30% of professional, amateur and student musicians take this medication on a regular basis which is, in itself, evidence of its perceived effectiveness.

Mental skill training (relaxation, goal-setting, imagery, self-talk and concentration) is a core component of sport psychology (2) that has been expropriated for use with performing artists. In part, this reliance on sport psychology techniques and strategies has been the result of the delayed introduction of psychological knowledge in the performing arts medicine field. Even with athletes however, the use of mental skill training has been mixed according to Gardner and Moore (1). They state that "the results of a large-scale, structured, qualitative review of the empirical literature on the use of combined mental skill techniques for the enhancement of competitive athletic performance are not encouraging".

One possible explanation for these mixed results may be that the use of mental skills is more appropriate for peak performance training rather than a treatment for performance anxiety. If the athlete or musician has an untreated anxiety disorder or any condition that disrupts mental functioning, no amount of mental skill training will enable peak performance. Within the field of clinical psychology, it has been long known that anxiety inhibits learning, memory and, based on the author's clinical experience, the deployment of peak performance training.

Finally, the use of cognitive-behavioral therapy (CBT) with musicians has been mixed as well. Kenny (5) found that treatments rarely lead to a complete cure and benefits are likely to be variable, depending on the extent to which they target all five symptom categories of MPA. Although CBT has been widely researched and a popular choice of treatment for anxiety disorders over the last several decades, (6, 7, 8)), many musicians have found it to be only moderately effective, a finding also endorsed by Gardner & Moore (1).

Again, the limited effectiveness of CBT may be explained by the powerful psychoneurophysiological activation that performance triggers for many (9, 10). The power of the system-wide bodily response has not been fully recognized by performing arts health practitioners, in part because the focus of CBT has been primarily on the cognitive symptoms of anxiety. This may be why medication has been found to be so helpful for a significant percentage of MPA sufferers. But there is little doubt that the ability to self-regulate arousal states plays an enormous role in fine motor movement, memory retrieval, concentration and musicianship. Based on LeDoux's findings (9, 10), attempting to de-escalate arousal through cognitive-behavioral techniques is like trying to "swim upstream against the current".

There are also practical reasons why CBT is so readily employed in the treatment of MPA that may overshadow their true effectiveness for musicians. The American mental health field is tied to managed care's preference for short-term, symptom-focused treatments. CBT also translates well to the laboratory where the use of questionnaires in pre-post research designs are relatively easy to conduct. For this reason alone, these studies lack ecological validity which renders their findings suspect.

There are also methodological issues tied to these "empirically validated" treatments. Many CBT studies typically enroll only those subjects who present focal MPA and exclude any subject with comorbid anxiety and/or depressive disorders. Westen & Morrison (11) writes:

"A careful examination of ...short term treatments that are 'empirically validated' ...is only skin deep: it does not extend to the 50 to 70 percent of the patients who are included but who fail to improve: and does not apply to those patients who improved but who, two years after termination from brief therapies, can expect to relapse with as high rates as patients who received a placebo" (899).

Furthermore, musicians are as susceptible to anxiety and other mental health disorders as anyone in the general population. But they are especially vulnerable to anxiety because of the unique challenges presented by public performance. For this reason, the assessment of music performance anxiety must be broadened to rule out all anxiety-based mental health conditions including generalized anxiety disorders, social anxiety disorders, phobic and panic disorders, post-traumatic stress disorders as well as depressive disorders.

What can we do to improve treatment outcomes?

Until quality outcome studies are conducted that compare the efficacy of different interventions on performance quality, it makes sense for clinicians to step back and review this new perspective with an eye on how they might reformulate interventions to better serve musicians who suffer from MPA.

Below is a summary of some of these preliminary conclusions to stimulate discussion and guide future treatment planning:

1. Our understanding of what MPA is has been limited by its popular description as "stage fright" which has influenced clinicians and researchers to define it only as a situational manifestation of anxiety (state anxiety) tied to a performance event.

2. Anxiety is a key feature in several diagnostic mental disorders and the diffuse nature of anxiety allows it to attach itself to a variety of internal and external stimuli, especially performance.
3. The unique aspects of anxiety and its function as a “signal” for deeper emotional conflicts has been under-recognized resulting in treatment plans that do not address underlying psychological conflicts.
4. MPA can manifest as one of several sub-types with different sources contributing to complex symptom profiles with varied levels of intensities.
5. Symptom-focused treatments are especially prone to high relapse rates because the underlying sources of MPA are not being addressed.
6. To increase treatment success, a multi-stage, multi- intervention treatment model is recommended to treat all underlying sources of anxiety.
7. Treatment plans for MPA should target the physiological arousal and somatic symptoms first using lifestyle and “brain-based” techniques such as daily meditation, daily cardio exercise, HRV biofeedback and/or neurofeedback and, if necessary, beta blocker medication.
8. Those with high trait anxiety, anxiety sensitivity and genetic pre-disposition to mood disorders may require beta- blocker medication as a base treatment if performance- based interventions are to be effective.

Specific Treatment Plans for Different Sub-Types

Kenny (12) identifies seven main treatments for MPA including Cognitive/Behavioral (CBT) models, Emotion-Based treatments, Psychodynamic approaches, Performance-Based approaches, Psychopharmacological approaches, Brain-Based approaches and Multimodal treatments.

Multimodal approaches that combine various theoretical models of treatment are encouraged since MPA had been shown to be especially resistant to treatment and vulnerable to relapse. The adage “more is better ” applies in the treatment of MPA to address the varied symptom clusters, underlying issues and performance- based problems. For some of the more complicated sub-types (all those listed below except focal MPA), a two stage treatment plan is recommended: 1) personality based treatments and 2) performance-based treatments.

Below are recommendations for treatment planning for different sub-types of MPA ranging from mild to severe symptomatology:

1. Self Help Techniques for Pre-Performance “Jitters”

Physiological arousal is a normal response to performing in public and is necessary to drive inspired performance. However, arousal is distinct from music performance anxiety. In other words, not all arousal creates anxiety whereas anxiety always involves physiological arousal. There are references in the literature about “adaptive” and “maladaptive” forms of MPA but this may reflect confusion between the terms “arousal” and “anxiety”. However, there does appear to be a fine line between arousal and anxiety for many performers. All musicians need to identify their own optimal zone of arousal that provides the necessary energy to meet the physical and mental demands of performance- without triggering anxiety. Being able to evoke this optimal activation level on demand is a key part of performance preparation.

Recommended Techniques:

1. Diaphragmatic breathing and focusing techniques

2. Use of key works that cue sensation of calm alertness
3. Mental rehearsal of optimal performance behaviors
4. Use of cardio exercise to locate optimal arousal states and discharge excessive physical activation
5. Use of imagery to reinforce the desired “mindset” associated with optimal performance
6. Allow excitement and enjoyment to inform your performance
7. Execution of pre-performance routines to contain anxiety, enhance focused concentration, provide needed rest, nutrition and warm-up and locate optimal zone of activation

2. Focal Music Performance Anxiety/Classic State Anxiety

Focal MPA is what has traditionally been identified as “stage fright” —a situational response of anxiety to performance events— that abates once the threat is over. If anxiety is associated ONLY with performance and the problem emerged more recently, situational elements in the current performance event may be responsible. However, when there is an extended problem history, it is more likely that other sources of anxiety are involved.

State anxiety can be initially treated with CBT as it has been in the past. As always, on-going compliance with treatment protocols is required to derive maximum benefits. In the case of mental skill training in particular, regular practicing of the skills is essential to fully learn and be able to deploy on demand. Autogenic techniques as well as the self-help techniques listed above can also be effective on a case by case basis. But if they do not show benefits, treatment options should be broadened. Even with the reduction of symptoms, new stressors, challenging circumstances or even physical injuries can reactivate the anxiety at any time, especially if one happens to experience either an actual or perceived poor performance causing a loss of confidence that carries forward to the next performance.

Musicians must be objective with themselves about the adequacy of their practice routines and preparation for performance. Being unprepared to perform certain repertoire will likely trigger some anxiety as the performance date approaches causing a loss of confidence. No treatment can compensate for the anxiety that comes from inadequate preparation.

Finally, do musicians set reasonable expectations for their performance? Is the goal to be “perfect” or “the best you can be”? Are mistakes seen as learning opportunities or threats to one’s self-esteem? What is the state of the relationship between the personal self and the performing self? Within the sports field, the outcome goal is to win games. But the process goal (the more important goal for any performer) is to get better, practice by practice, game by game, season by season. Is that how musicians see their performances?

Recommended Techniques and Treatments:

1. **CBT techniques** have shown varying degrees of effectiveness if practiced on a consistent basis (40):
 - 1) Exposure/Desensitization to performance situations
 - 2) Relaxation training
 - 3) Systematic desensitization
 - 4) Progressive muscle relaxation

- 5) Behavioral rehearsal
 - 6) Thought stopping
 - 7) Cognitive restructuring
 - 8) Attentional training
 - 9) Positive self-talk
 - 10) Positive Imagery
2. **Eye Movement Desensitization & Reprocessing (EMDR).** EMDR is an evidence-based treatment for anxiety disorders that activates the implicit memory network while facilitating adaptive information processing (13). EMDR allows for memory reconsolidation of past negative performance experiences that discharges emotional tension. Known primarily as a treatment for trauma, Foster & Lendl (14) developed EMDR-PEP (performance enhancement protocol) that has been used effectively with athletes, musicians and public speakers to reduce anxiety and enhance performance goals. It has also been used to treat self-defeating beliefs, behavioral inhibition, posttraumatic stress, and psychological recovery from physical injury (15).
 3. **Cardio Exercise.** Cardio (aerobic) exercise may be the best natural treatment for anxiety in general and performance anxiety in particular (17, 18, 19). Exercise is effective both in the long run to reduce trait anxiety (17, 19) and in the short term to discharge excess situational (state) anxiety. Exercise releases calming neurotransmitters such as dopamine, GABA and serotonin that help regulate mood. Vigorous exercise can reduce anxiety simply by de-conditioning the physical sensations of arousal (pounding heart response) from anxiety by attributing the bodily arousal to the exercise rather than the anxiety. Exercise can provide distraction from the anxiety-producing performance situation (20) by interrupting the cognitive symptoms of anxiety. Exercise offers a sense of control, mastery and physical release that counteracts the anxiety response. Doing daily cardio exercise at varying levels of intensity leading up to a performance may be the most overlooked strategy for managing state anxiety. Moderate exercise several hours before performance can lower somatic anxiety. Care must be given to time the exercise to align with one's optimal zone of activation for performance.
 4. **Meditation and Yoga.** Both techniques are "lifestyle" interventions that can play a foundational role in the treatment of MPA (21). Both techniques balance the mind and body and produce a synchronization between the left and right hemispheres that is probably a pre-condition for inspired musical performance. This is referred to as "brain coherence" and it is a key component of the flow state. If musicians can access that state through a daily practice of meditation and/or yoga (often referred to as "moving meditation") and apply it to the performance situation, on demand, they will likely perform their best. One overlooked benefit of meditation and yoga is that it allows you to see the "big picture" in life allowing performance to be put in perspective and adding some acceptance and compassion for the challenges that come with performance (24). Performance must find its best place in the psyche of the musician to enable them to actually enjoy the experience of playing music!

3. MPA Tied To Past Performance Problems

Past performance problems typically have not been acknowledged as a source of MPA and therefore have not been a focus of treatment. Kenny (12) was among the first to identify conditioned negative

responses to performance as a source of MPA. More often than not, musicians have had to provide their own post-performance debriefing to identify what went wrong, how to fix it and how to prevent re-occurrence. Not all musicians can do this because of the intense feelings of anxiety, shame and disappointment triggered by bad performance. Because confidence in performance is closely tied to recent and past performance success, not addressing negative performances in the treatment of MPA is a major oversight and may contribute to the development of more severe and persistence forms of MPA.

Some personalities are inclined to focus more on the negative than the positive and this bias is especially debilitating for musicians who “live and die” with their last performance. Past negative performances have a way of staying in mind and can become associated with other situational cues that further establish the link between the conditioned negative response and performance. Sometimes, past performance “meltdowns” can be experienced as traumatic and requires special treatment to resolve (22). Traditional de-briefing and talk therapy will not always access the implicit memory system that hold the emotional contents of the traumatic performance (23). For this reason, new “brain-based” treatments should be considered.

Recommended Techniques and Treatments:

1. **Debriefing** past performances with a teacher, counselor or mental health professional and assess what internal or external factors lead to the poor execution is suggested. Use of questionnaires to pinpoint the source of the anxiety is recommended and can be used to guide treatment.
2. **Eye Movement Desensitization & Reprocessing (EMDR)** EMDR is especially effective in reducing traumatic reactions to negative life experiences including poor performances (22). EMDR can reveal negative feelings and memories associated with past performance events that become linked to current performances. EMDR is especially effective in discharging emotional learning that can shape attitudes and beliefs about oneself as a musician (“I tend to freeze up in auditions”).
3. **Mental Rehearsal and Cardio Imagery & Rehearsal** are two similar techniques that rely on the learning potential of guided visualization or imagery to encode mental representations that reflect the desired performance state. These techniques can be used to replace old mental representations of past performance problems once the past performance event has been fully processed, preferably using EMDR. Mental rehearsal has been shown to be almost as good as physical rehearsal, especially when the musical repertoire has already been learned. Using mental rehearsal over several days prior to a performance activates brain plasticity allowing the behavioral scripts to be more easily retrieved during performance.

If moderate cardio exercise (heart rate = 120 – 130) is added to the mental rehearsal, new memory scripts for preferred performance behaviors can be reinforced via the concept of applied neuroplasticity . Twenty to thirty minutes of combined cardio exercise and mental rehearsal of pre-determined behavioral scripts of preferred performance for seven to ten times during the two weeks prior to performance has been found to be surprisingly effective. This technique has not yet been experimentally tested so conclusive results cannot be reported at this time.

4. **Perform in low-stress situations** (among friends, smaller groups, those with less musical knowledge etc.) to build confidence before proceeding to more challenging performance situations. This is an exposure and a mastery technique tied to a hierarchy of escalating challenges and can be very effective in rebuilding confidence through gradual mastery of the performance situation.

4. MPA and Co-Morbidity With Other Diagnostic Conditions

There are many negative life experiences during both childhood and adulthood that can create vulnerability to anxiety that may get triggered in the face of performance threat (11). As previously stated, anxiety is present in a range of mental conditions including the various anxiety disorders and often “signals” deeper emotional conflicts. Early separation and loss of parenting figures, childhood trauma, stressful life events such as parental divorce, family illness as well as addictions, major depression, reactions to physical injuries and occupational stress are some of the stressors that can trigger anxiety.

When MPA and other diagnostic conditions exist co-morbidly, it may disguise the presentation depending on whom is making the assessment. For this reason, musicians, teachers and coaches may see only the MPA and overlook the underlying disorder. Considering that anxiety is a major concern for many musicians, they may rely on alcohol or illicit drugs to medicate the anxiety, thereby creating a risk of addiction which must be treated first. Referrals for mental health assessment should be made by teachers, coaches and schools if there is any indication that anxiety is interfering with their development as musicians. If one has an underlying anxiety disorder, depression, addiction, grief reaction or panic disorder, it is essential that that becomes the first focus of treatment, not the performance anxiety. If underlying diagnostic conditions are not addressed, it will render even quality treatment of MPA less successful and vulnerable to relapse.

Recommendations for Techniques and Treatments:

1. **Make referrals** to a specialist in anxiety disorders and/or performance anxiety to rule out other co-morbidities if anxiety levels are extremely high or if other mental health conditions are apparent.
2. **Psychological treatment** of all co-morbid conditions in a sequential multi-modal treatment plan beginning with addictions (if any), psychotherapy for past traumas, anxiety disorders, and psychological effects of physical injuries. Use of brain-based treatments for trauma. Use self-help groups such as AA to address drinking problems and other addictive/compulsive activities.
3. **Mindfulness, Acceptance and Commitment Therapy (MAC) and Acceptance and Commitment Therapy (ACT)** are two similar approaches that are used in clinical settings to treat anxiety disorders (1, 25) and recently has been used to treat MPA (26). Both approaches promote acceptance of one’s internal experiences, as they are, so that attention is maintained externally on the performance and on eliciting appropriate performance-related responses. The MAC/ACT approach is organized into five components taught over a seven-week period, including mindfulness strategies, values identification and commitment, acceptance, integration and practice. Non-judgmental acceptance of one’s anxiety challenges the strategy common in CBT treatments to suppress, contain and/or to restrict symptoms that have been found to be less effective over time and leading to relapse.
4. **Medication evaluation** is necessary to rule out a variety of mental health conditions that require medication as part of the standard treatment. Besides beta-blocker medications for MPA, other medications targeting depression, ADHD, panic and sleep disorders may be necessary to stabilize the mental functioning of the performer.
5. **Apply performance-based interventions** after treatment of co-morbid conditions including mental rehearsal, gradual exposure to increasing performance challenges and lifestyle, self-regulation techniques such as exercise, meditation and if necessary, bio/neurofeedback (27, 28). Use mental rehearsal and Cardio Imagery & Rehearsal to practice performance skills leading up to the performance.

5. Severe MPA As A Disorder Of The Self

Kenny (11) has suggested that this sub-type of MPA requires special attention with respect to identification, assessment and treatment. It is the most difficult sub-type to treat and requires a multi-stage treatment approach with a significant investment of time and effort. Performers with this type of MPA experience such an extreme form of anxiety that “it essentially defines them as people and in particular, their experience performing” (11). Kenny references work by Kohut (28) and Winnicott (29) to describe “a severe narcissistic vulnerability that expresses itself in an insecure sense of identity, extreme sensitivity to hurts and sleights and catastrophic reactions to their own perceived or actual failures” (p. 234).

Weisblatt (30) outlines four themes common in musicians who present with this sub-type that may underlie the symptom profile:

- 1) Musicians seek to acquire the recognition from the audience that they failed to receive from the emotionally unavailable parents. However, they fear they will humiliate themselves by failing short of their idealized fantasies for adoration leading to feelings of shame, inadequacy and despair.
- 2) Musicians who once enjoyed parental devotion and support for musical activities and then suffered a loss of parental support can transfer those needs onto the music teacher. This so-called “transference reaction”, so common in psychotherapy between a patient and a therapist can happen in any highly charged relationship, especially those that reflect differences in power, authority and investment, Musicians may consciously or unconsciously seek to please the teacher in an attempt to master a past unfulfilling parental relationship. But, they also play out their anxious attachment to the teacher over concerns that their insecure support will be conditional on the quality of their performance.
- 3) Musicians may come to view performance as a chance to triumph over a competitive or hostile parent by overwhelming the audience with a spectacular performance. However, the pressure to perform exceptionally well and the significance of defeating the parent may bring up unconscious guilt leading conflicts over success and the unconscious need to fail.
- 4) The parents’ approval of the child was conditional based on them being subordinate to parents’ wishes. If the parent disapproves of the choice of musical career, they withdraw their support. Musician may suffer loss of parental support if successful.

From a clinical point of view, it appears that these musicians suffer from early attachment wounding that impacts the musician’s identity and self esteem. Anxious and avoidant attachment styles are by-products of poor parental response to the infant and child’s needs. Insecurity in their identity as people undercuts their confidence as performers. These musicians are dependent on affirmation from others to maintain their self-esteem since they have not developed the inner capacity for self-affirmation. McWilliams (31) writes that they become preoccupied with how they are perceived by others that triggers feelings of being a fraud, accompanied by a sense of worthlessness and inferiority. Kenny (11) writes that “when these attachment systems are faulty, their activation at times of stress and crisis is likely to result in emotional dysregulation” (p. 239).

For this reason, public performance is likely to be experienced as especially threatening, if not dangerous, with affects of fear, terror and shame breaking through defense mechanisms. Musicians who suffer from this level of MPA are unlikely to enjoy performing and are at risk for early departure from the stage. Treatment requires a multi-stage treatment plan that first addresses the attachment wounds and any other underlying source of anxiety before re-building confidence through gradual exposure to low-stress performance events building to higher stress situations.

Recommended Treatments:

1. **Psychodynamic psychotherapy.** From a psychodynamic standpoint, MPA is understood to be caused by unconscious dynamics between desires, wishes and conflicts that interferes with the musician's ability to express themselves musically (32). Nagel (33) in a review of psychodynamic approaches makes the point that underlying emotional issues and conflicts that are largely outside of conscious awareness can "gestate" dating back to childhood before becoming a problem with MPA years later. Consistent with Kenny (11), these more complicated cases can be resistant to traditional symptom-focused treatments because they are not "deep enough" to access unconscious contents. Nagel suggests that fear of failure may indicate a fear or guilt about not being "good enough" as a person. The boundary between the person and the performer becomes porous and the anxiety tied to their identity spills over into mental functioning required for performance.
2. **Develop A Performance Identity That Is Aligned With One's Sense of Self.** Following intensive psychotherapy as described above, the musician still needs to build a separate identity as a person that supports their identity as a performer independent of the parents' wishes. Other sources of MPA, if any, need to be addressed using the interventions mentioned above. If trait anxiety or anxiety sensitivity is also present, beta blocker medication may be necessary.
3. **Performance-Based Techniques.** Performance-based interventions can be built upon the new foundation of self and performance identity and practiced using exposure techniques and the emerging virtual reality products now coming onto the market. Cardio exercise, meditation, imagery and mental rehearsal can all be employed during the practice and performance preparation.

6. High Trait Anxiety and Anxiety Sensitivity

Musicians who score high in trait anxiety and/or anxiety sensitivity have a special challenge in managing their performance anxiety. Genetic vulnerabilities to any mood disorder including depression increases susceptibility to anxiety disorders as well, including performance anxiety. Short term, symptom focused interventions will not be powerful enough to override biological traits toward increased activation (16, 17).

The best solution is to incorporate "lifestyle" activities such as meditation, yoga and cardio exercise (34) that will lower normal activation levels through the discharge of physical and mental energy. These interventions need to be practiced on a daily and weekly basis however for benefits to be gained over the long term. Lifestyle changes offers the musician more margin when MPA levels start to go up in anticipation of performance. Since symptoms are produced at different thresholds of activation, having a lowered base rate of physiological activation allows coping strategies to not become overwhelmed.

In some cases, beta-blocker medications such as propranolol (Inderal) may be necessary to help those high in trait anxiety and anxiety sensitivity deescalate anxiety. Beta-blockers block epinephrine receptors in the brain thereby preventing elevations in blood pressure, heart rate and breathing. Beta blockers can be used as a base treatment of physiologically-based anxiety in concert with the other treatments listed above.

If one accepts that the physiological response drives the range of affective, cognitive, psychological and behavioral symptoms, treatment approaches that impact those bodily systems should be targeted for intervention. Mindfulness-based stress reduction, meditation, yoga, autogenic techniques including breathing, biofeedback and neurofeedback and cardio exercise (16, 17, 18, 19) directly impact physiological functioning and can enhance self-regulation. Some techniques, such as meditation and bio/neurofeedback, may take several weeks before having a positive impact.

Recommended Treatments:

1. **Meditation.** Meditation has been typically described in the sport psychology literature as primarily a relaxation technique (2) although research over the last thirty-five years and hundreds of studies have shown that it also promotes attention, concentration, mental discipline and reduction of distractibility. Meditation has been shown to have a variety of effects on brain functioning such as increased blood flow to the brain, increased flexibility, more efficient information transfer in the brain, improved left and right brain coherence, increased stability of the autonomic nervous system and improved mind-body coordination. Transcendental Meditation TM is the most researched type of meditation with hundreds of studies touting its many health and mental benefits. More recently, Mindfulness Meditation has increased in popularity especially for its stress-reducing properties (24). Although there have been few studies using meditation specifically for MPA, one study (21) did find reductions in MPA pre and post intervention. Meditation must be practiced twice daily for up to eight weeks before benefits can be perceived by the musician.
2. **Cardio Exercise.** As written above, cardio exercise can play a crucial role in helping to reduce both state and trait anxiety (16, 17) as well as anxiety sensitivity. Exercise does several things that impact anxiety: it reduces muscle tension; it builds brain resources by increasing neurotransmitters such as serotonin and GABA which is the brain's primary inhibitory of arousal mechanisms. Exercise also improves pre-frontal cortex functioning to inhibit the fear response and even calms the amygdala which is the center of emotion. Exercise can give a psychological boost to those predisposed to anxiety sensitivity by offering a sense of mastery and control over their bodily reactions. Being fit usually adds to self-confidence, reduces fear and inoculates against stress. Exercise should be done for a minimum of forty-five minutes per day, five days per week. Cardio and resistance (weight training) exercise can be divided per workout but the reduction in anxiety is more tied to the cardio type owing to the effect on the heart and respiratory system in pumping blood throughout the body and brain.
3. **Biofeedback, Neurofeedback and Virtual Reality.** Biofeedback (EMG and HRV), neurofeedback (EEG Brainwave) and Virtual Reality are three techniques that show promise in regulating the physiological symptoms of MPA (26) and desensitizing symptoms through exposure. However, there are practical aspects of these treatments that may dissuade musicians from utilizing them including time, cost and ease of usage.

EMG biofeedback aims to reduce muscle tension by training the person to make physical adjustments in their muscle activation based on a visual display that guides their actions. Heart Rate Variability (HRV) biofeedback operates on the same principle but focuses on variations in heart rhythms to lower activation. There have been few quality studies on either method but those that have been conducted have shown reductions in anxiety.

Neurofeedback measures EEG brain activity to foster self-regulation of brain waves using the same principle of providing immediate feedback to learn new self-regulation behaviors. By training musicians to access particular brain waves, musicians can control attentional and activation capacities that will support optimal performance. A series of quality studies by Gruzelier et al. (26) and Egner & Gruzelier (27) comparing neurofeedback with several interventions including Alexander technique, exercise, meditation and mental skill training found that neurofeedback training to evoke an alpha/theta brain wave “displayed significant improvement in musicality, stylistic accuracy, interpretative imagination and overall performance quality”. Based on the brain's neuroplastic qualities, training in alpha/theta brain waves may be the best strategy to evoke the “flow” state.

New virtual reality (VR) products are coming onto the market that offer efficient methods for introducing exposure techniques that can desensitize performance threat. VR has been shown to be effective with soldiers, accident victims and victims of trauma by gradually

exposing the person to the anxiety-producing situation and tricking the brain into de-escalating arousal. Pairing relaxation techniques with exposure can be particularly effective at reducing sensitivity to performance cues.

4. **Mindfulness, Acceptance and Commitment Therapy (MAC) and Acceptance and Commitment Therapy** can be helpful as a foundation treatment to take pressure off the performer and reduce judgmentalness for having the physiological make-up that makes performing more challenging. Self-acceptance for who you are as a person and performer is essential for true enjoyment of music-making.
5. **Medication.** The use of beta-blocker medication has been a key treatment for MPA for many years. It has been estimated that some 20% to 30% of all orchestral musicians use beta-blockers on a regular basis to reduce the physiological symptoms of anxiety (5). One study by Kenny (11) found that among orchestral musicians, 67% found beta-blockers “very effective” at controlling the somatic symptoms of anxiety and 25% found them “quite effective”. Other anxiolytic medications have also been commonly prescribed but the side effects (drowsiness, slowing of motor functions) and addictive potential for Xanax, Valium, Ativan and Klonopin make them less attractive.

Why are beta blockers so attractive to musicians who suffer from MPA?

Three reasons:

- 1) Beta-blockers are effective at reducing physiological activation of the heart and lungs
- 2) Other non-medical treatments have been less effective in providing sustained relief from the physiological symptoms of MPA.
- 3) Beta-blockers are safe, inexpensive and readily available with a doctor’s prescription. There are contra-indications for people suffering from asthma, select heart conditions and other conditions associated with aging.

Beta-blockers medication, however, will not eliminate the fears of performing or the cognitive, behavioral or psychological symptoms of MPA. They may well reduce the intensity of those symptoms owing to the reduced activation of the heart. By reducing physiological activation, they may allow other treatments including peak performance training to be more effective. The bottom line is that reducing physiological activation of the heart is a crucial first step in treating MPA for biologically vulnerable musicians and beta-blockers take less time and effort than longer term, non-medical interventions such as meditation and neuro/biofeedback.

Conclusion

Quality assessment of MPA is essential to construct comprehensive treatment plans that address all underlying sources of MPA. For treatment to be effective, a multi-modal approach offered in a two stage process that first addresses underlying sources of MPA as well as any co-morbid or biological conditions and past performance traumas. Second, specific performance-based interventions involving mental skill training combined with gradual exposure of increasingly challenging performance situations will build confidence over time. Performance strategies and peak performance training should commence when the treatment of MPA has been mostly completed.

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BIPOLAR DISORDER, SENSORY-PROCESSING SENSITIVITY AND THE CREATIVE EXPERIENCE OF PERFORMING ARTISTS

State of the Art Review

PAMA/NASM Task Force on Psychological Health

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Across the centuries the link between creativity and mental illness has been observed, and anecdotally, there have been many examples of compelling associations that suggest this relationship. This link between creativity and mental illness first appeared in the literature in the 1970's, but the notion of a connection of "madness" and "genius" dates back at least to Aristotle. The ancient Greeks believed that creativity came from the gods, particularly from the Muses (the mythical personifications of the arts and sciences). Romantic writers had similar ideas, as Lord Byron expressed "We of the craft are all crazy. Some are affected by gaiety, others by melancholy, but all are more or less touched".

However, to date, only a limited number of empirical research studies have been designed to examine mood disorders in highly creative individuals, and most of these studies have investigated writers (Andreasen, 1974, 1987; Jamison, 1989). In these studies the preponderance of the evidence indicated that in these creative subjects the rate of mood disorder is high, and that both bipolar and unipolar depression are quite common.

Bipolar Disorder and Creativity in Musical Artists

Most artists speak about a strong relationship between their fluctuating moods and creative productivity, and of the necessity to modify the impact of these moods during periods of creative work. With this in mind, I designed a research study to investigate the relationship between moods, quality of object relations, the level of ego development, and their influence on the creative productivity of young classical solo musicians (Colvin, 1994). Although it is well documented that Bipolar Disorder or Manic--Depressive Illness is a genetically linked disorder (Goodwin & Jamison, 1990, 2007), my study was designed to probe the complementary influences of psychological factors that may predispose the artist to a mood disorder. It is suggested here that the artistic ability to successfully symbolize subjective experience arises from a confluence of a repertoire of feelings and moods, interpersonal experiences, and a sophisticated ego structure involving a complex matrix of cognitive schemas.

In summary, the research results of this study (Colvin, 1994) showed that musicians (N=40) reported a higher incidence of mood disorder than the non--musician control group (N=40), with highly significant differences noted between the groups (results at the $p < .001$ level). A high total percentage of mood disorders in the musician group: 52.5% reported a Bipolar Disorder (25% with Cyclothymia; 12.5% with Hypomania (Bipolar 2 Disorder); 5% Bipolar 1 Disorder; 2.5% Cyclothymia – Balanced; 0% Cyclothymia --- Depressed); and 7.5% classified as Hyperthymic (a constellation of symptoms described by Depue et. al. (1981) as a pre--hypomanic category). This rate is quite high when compared with lifetime prevalence estimates of 1% for Bipolar Disorder (Goodwin & Jamison, 1990, 2007). Further, musicians demonstrated highly significant differences from non--musicians on the General Behavior Inventory (GBI) Depression and Hypomania Score, and the overall Affective Dysregulation score. Additionally, musicians reported more disturbed patterns of object relations than non--musicians, with elevated Alienation and Egocentricity subscales (results were significant at the $p < .05$ level). Musicians also demonstrated higher overall scores on the Ego Development scale than the non-- musicians. Overall, the musicians group –

92.5% reported that they experienced a strong relationship between their moods and creative productivity, and that their moods were integral and necessary to their creative work. However, the musicians further reported that extremes of mood – either elation or depression – interfered with their ability to produce high-level performances. Yet, there was also a somewhat contradictory finding that suggested the positive effects of hypomanic symptoms during intense creative periods enhanced artistic productivity. Although these young musicians demonstrated substantial disturbance in their moods and object relations, as well as revealing more complex ego structures, they were regarded, at the time of this study, as being highly successful performing artists with the ability to consistently produce meaningful musical products, and the likelihood of a prominent career.

These findings have important implications: 1) if at this early stage in their development as performing artists these musicians are showing significant difficulties with mood regulation (meeting the diagnostic criteria for Bipolar Disorder) what are the predictions for their continued successful development as performing artists? 2) Musicians clearly rely on their moods as catalysts for achieving meaningful artistic products; and interestingly these results also suggest positive effects of hypomanic symptoms during creative periods. 3) This may indicate the function of ego strength, and a corresponding higher level of ego development. Here, they are seemingly able to modulate intense feelings in order to promote the symbolization process of making music, and facilitate an artistic product that is highly satisfying. 4) This more complex ego functioning in musicians can likely be meaningfully understood from the viewpoint of the organization of the artistic ego, where the musicians demonstrated a superior ability to filter subjective experience appropriate to the demands of the symbolizing activity required of the performing artist.

And finally, the psychodynamic profile that emerged from this research indicates a group of young artists who are summarily influenced by the symptoms of bipolar disorder including faulty mood regulation, disruptive interpersonal relationships, and a highly complex ego organization. In reaction, they show a tendency to question their talents, and demonstrate a lingering need to be validated and appreciated. One of the musicians in the study concluded: "...although I find it necessary and important to think about music, I am always conscious of the fact that feeling must remain the Alpha and Omega of a musician, therefore my remarks proceed from feeling and return to it again."

Bipolar Disorder and Creative Artists

How do we understand bipolar disorder? People with bipolar disorder experience both mania (an exceptionally elevated, irritable, or euphoric mood) and depression. While the frequency of episodes vary, they can be separated or symptoms of mania and depression can occur at the same time. At least four depressive, manic, hypomanic (the milder form of mania) or mixed episodes occurring within a year is known as rapid-cycling bipolar disorder.

Bipolar Disorder has been somewhat romanticized in the literature by its association with creative artists, but what sufferers' experience with this form of mental illness is far from glamorous. Sometimes bipolar patients require hospitalization because they can't function in their lives, or at worst they become suicidal, particularly if they don't take their medication as prescribed. During a manic or hypomanic episode the person can feel a euphoric mood and the world seems full of opportunity. They meet new friends, spend money on beautiful things, and sometimes feel invincible. So is there something about bipolar disorder that can be conducive to creative expression? Studies in both psychology and medicine offer evidence for the link, but to date they have only focused on well-known people diagnosed posthumously, or on small groups of patients.

Artists can describe their feelings during moments of creative activity as elated, expansive, and fluid. Some evidence exists regarding the experience of expansiveness of thought, a common feature in mild mania, which promotes an increased fluency of ideas conducive to creative

productivity (Jamison, 1989, 1996). In her book Touched with Fire: Manic--Depressive Illness and the Artistic Temperament Dr. Kay Redfield Jamison (1996) has offered the definitive work to date on the compelling links between bipolar disorder and creativity. Through her research studies, she related what is evident in the biological foundation of bipolar disorder to the lives and work of some of the world's greatest artists including Lord Byron, Vincent Van Gogh, Virginia Woolf, Hemingway, Robert Schumann and Handel. For example, Schumann's depressive periods prevented any musical composition, while hypomanic periods appeared to have significantly enhanced his artistic output (see Figure 1). Handel also composed prolifically during his hypomanic phases, and accomplished little while depressed. And Van Gogh completed approximately 300 paintings, many of them his finest, during hypomanic episodes in the last years of his life. The volatile and intense moods associated with the artistic temperament were once thought to be a hallmark of artistic genius; but Dr. Jamison demystifies this notion and shows in her research that many artists who experienced euphoric highs and despairing lows were in fact wrapped up in a struggle with clinically identifiable manic--depressive illness. She presents the argument that people with affective disorders tend to be overrepresented in the creative artist population, and that bipolar disorder may carry certain advantages for creativity, especially in those who have milder symptoms. Because hypomania decreases social inhibition artists can often be more daring and bold. Since these symptoms are not equivalent to the more severe symptoms of a clinical manic episode, the artist while experiencing milder symptoms of hypomania might find them conducive to creative expression.

In her moving scientific autobiography The Unquiet Mind: A Memoir of Moods and Madness (1997), Dr. Jamison describes her own experience of manic--depressive illness with its bitter costs and paradoxical benefits. She tells us "There is a particular kind of pain, elation, loneliness, and terror involved in this kind of madness . . . it will never end, for madness carves its own reality". Her book is written with clarity, truth and insight into the human character. She goes on "We are all, as Byron put it, differently organized. We each move within the restraints of our temperament and live up only partially to its possibilities." Dr. Jamison has championed the study of manic--depressive illness and suicide both as a clinical researcher (as a Professor of Psychiatry at Johns Hopkins School of Medicine) and patient. In Night Falls Fast: Understanding Suicide (2000) she tells more of her personal story, about planning her own suicide at 17, and attempting to carry it out at 28: "Suicide is a particularly awful way to die, the mental suffering leading up to it is prolonged, intense, and unpalliated." She further writes "There is no morphine equivalent to ease the acute pain, and death not uncommonly is violent and grisly." Her goal in this book was to explore the complex psychology of suicide, especially in people under 40 years old, why it is one of our most significant mental health problems, and how it can be prevented and effectively treated. She discusses the close relationship of manic--depressive illness and suicide in different cultures, and illustrated her points with anecdotes about people who have attempted or committed suicide – some famous, some ordinary, and many of them young. In sharp contrast to the weighty themes of bipolar disorder and suicide, Dr. Jamison has written Exuberance: The Passion for Life (2005). Perhaps her enthusiasm and sense of wonder as she considers the contagious nature of exuberance, bears out her own conclusion that the milder effects of mania are conducive to creative activity. She defines exuberance as "a psychological state characterized by high mood and high energy", which in fact are symptoms of hypomania. She again offers diverse and delightful examples in personalities such as John Muir, FDR, Peter Pan, Mary Poppins and Snoopy.

Researchers have demonstrated that familial patterns of creativity and mental illness exist as well. In a study of writers, Andreasen (1987) showed that 80% met diagnostic criteria for bipolar illness or depression, and that the first--degree relatives of the writers were more likely to have mood disorders than were the relatives of the controls; they additionally were more likely to have histories of creative accomplishment. Harvard researchers, Richards and colleagues (1988), demonstrated in their study with non--eminent subjects, higher creativity scores in individuals with bipolar and cyclothymic disorders, as well as their normal first--degree relatives, than among controls.

A recent, large, well---designed population---based study adds further support to the relationship between creativity and bipolar disorder. Kyaga and his associates (2011) added to the body of evidence showing a disproportionately high rate of mental illness, especially bipolar disorder, in creative people. Their study was based on Swedish national registries, and considered the likelihood of holding a creative profession (artistic and scientific occupations) in individuals (n=300,000) with schizophrenia, bipolar disorder or unipolar depression and their healthy relatives was compared to that of controls. Results demonstrated that individuals with bipolar disorder and healthy siblings of people with schizophrenia or bipolar disorder are overrepresented in creative professions. Their results further support a genetic component in creativity, and support evidence for a familial cosegregation of both schizophrenia and bipolar disorder with creativity, and suggests that this may be mediated through a genetic mechanism. Interestingly, researchers have suggested that some features of bipolar illness and schizophrenia may offer some adaptive advantage to the affected individuals and their relatives. Keller and colleagues (2006) suggest that whatever the genetic and environmental mechanisms for this may be they are complicated and will likely be addressed most decisively in the future by neuroimaging, genetic and neuropsychological research.

In his book Tortured Artists: From Picasso and Monroe to Warhol and Winehouse, the Twisted Secrets of the World's Most Creative Minds (2012), Christopher Zara offers a modern cultural viewpoint as he explores the “tortured artist” stereotype and how it applies to the creative disciplines. The profiles of celebrated artists from music, drama, literature and visual art have a specific goal – to show how pain and suffering inspired the artists’ work, exploring the common thread that binds creative expression of every type of art. The surprising extent to which inner and outer turmoil drives the creative process is illustrated in the series of essays about the psychological issues of a mix of creative artists including Michelangelo, Warhol, Madonna, Charles Schultz, and many others.

Neuroscience and the Creative Brain

Nancy Andreasen (2005) brings neuroscience to center stage in her book The Creating Brain: The Neuroscience of Genius, offering insight into the relationships between creativity, mental illness, intelligence and the social environment. Her earlier studies of participants of the Iowa Writer’s Workshop (1987) showed a compelling correlation between mood disorders and creativity. Drawing from her own emerging research using positron---emission tomography (PET) scans of subjects brains during free association, Andreasen suggests that creativity arises largely from the “association cortex” – parts of the frontal, parietal, and temporal lobes that integrate sensory and other information. Her studies have led her to the preliminary conclusion that “extraordinary creativity” results from neural processes that “differ qualitatively as well as quantitatively” from those of other people. She further states that genetics may play some role, but there are other factors that predispose a person to creativity and mental illness. These factors include “*having an increased level of sensitivity*, increased tendency to be exploratory and adventuresome, and the tendency to go out on a limb and take a risk”. These are the very things that allow the individual to see the world differently and express themselves through creative modalities.

In his article “The Real Neuroscience of Creativity” in Scientific American (2013) Scott Barry Kaufman discusses how cognitive neuroscientists are on the forefront of investigating what actually happens in the creative brain at work. He explains that contrary to the left brain – right brain distinction, creativity is much more complicated and doesn’t depend on a single brain region, but rather the creative process involves many interacting cognitive processes and emotions, and depending on what the artist is trying to create, different brain regions are recruited. Neuroscientists suggest that in creative cognition three large---scale brain networks operate in dynamic interaction to produce results. Kaufman reviews them in this article: Network 1 “The Executive Network” is recruited for complex problem solving that puts demands on working memory, involving efficient communication between lateral (outer) regions of the prefrontal cortex and the posterior (back) area of the parietal lobe. Network 2 “The Imagination Network” is recruited for evolving dynamic

mental simulations based on past personal experience, and when imagining alternative scenarios in the present. This network involves areas deep inside the prefrontal cortex and temporal lobe (medial regions), in communication with regions of the parietal cortex. Network 3 “The Salience Network” consistently monitors external events and internal consciousness and settles on whatever information is most salient to resolving the problem. This network involves the dorsal anterior cingulate cortices and the anterior insula and is significant for the dynamic switching between networks. So the new understanding of the neuroscience of creative cognition involves both the knowledge of large-scale networks along with the differing patterns of neural activations and deactivations at various stages of the creative process. Kaufman cites a recent large review where Rex Jung (2013) and colleagues offer a “first approximation” about how creative cognition might map onto the human brain. They suggest that to loosen your associations, let your mind roam free, imagine new possibilities without the influence of your inner critic. It’s a good idea to reduce activation of the Executive Network, and increase activation of the Imagination and Salience networks. Recent interviews with musicians engaging in creative improvisation suggest that’s exactly what’s happening in the brain during a flow state. This model for creative cognitive processing proposes disciplined switching between the rational and imaginative thinking, each of which is supported by distinct networks in the brain. In conclusion, these researchers encourage us to ditch the outdated notions of how creativity works, and consider the many complications inherent in the creative process including dynamic brain activations and collaborations among many different regions of the brain that make it all possible. We can now hypothesize that the creative cognitive process involves the whole brain and how complex networks in both hemispheres communicate with each other. Although much more research is needed to investigate how the brain creates across the different domains, the neuroscience of the creative process is well on the way to considering efficient working models of brain functioning to guide the creative artist in understanding how they work.

In their new book Wired to Create: Unraveling the Mysteries of the Creative Mind Kaufman and Gregoire (2015) offer a description of the habits and personality dimensions of the creative person, and tell us that openness to new experiences is the strongest and most consistent personality trait that predicts creative achievement in the arts and sciences, as exposure to new experiences can shift our perspective and inspire creative leaps. Paradoxically, higher dopamine levels drive creative exploration and boost creative thinking, but are also associated with an increased risk of mental illness. The authors propose a new model for creative cognitive processing that includes “leaky” sensory filters where highly creative people show a reduced latent inhibition and thus have the ability to tune into greater amounts of information from their surroundings rather than automatically filtering and compartmentalizing their data. The idea of reduced latent inhibition illustrates the concept of a “messy mind” associated with creative thinking, because this “messy mind” holds onto and explores thought fragments that might seem irrelevant to a more organized mind. However, this “leaky” sensory filter can make creative individuals highly distractible, as Darya Zabelina and her colleagues (2015) discovered. They found that people with a “leaky” sensory filter tended to be more creative than those with stronger sensory gating. Zabelina observed that highly creative people are more sensitive to noises in their environment than less creative people: “Sensory information is leaking in . . . and the brain is processing more information than it is in a typical person”. This hypersensitivity to sound is a well-known characteristic in many eminent creators including Darwin, Kafka, and Proust. Although distractibility may at times be a hindrance to creative work, Kaufman suggests that *sensory hypersensitivity* most likely contributes to creative thinking by expanding the brain’s scope of attention and allowing creative people to take in more subtleties in their experience. Taking in more information increases the chances of making new and unusual connections and thus producing novel ideas. The creative person copes with paradoxes, extracts meaning and order from disorder, takes risks, feels passion and perseveres. Creative people are typically more sensitive, and respond strongly to emotional, cognitive, and physical stimuli. Sensitivity is then a useful trait for artists, because it allows them to be more aware, vulnerable and open to new experiences, which can then facilitate creative productivity.

Sensory-Processing Sensitivity and Creativity

“A truly creative mind in any field is no more than this: A human creature born abnormally, inhumanly sensitive.” --- Pearl S. Buck

Elaine Aron’s groundbreaking research (1997) finally identified essential and relevant information needed to better understand the artistic temperament. The idea of “artistic” or “sensitive” temperament has been supported historically by ample anecdotal evidence, and with Dr. Aron’s research we now have systematic investigations supporting the idea of a distinct personality trait of high sensory sensitivity, which has broad implications for understanding the artists’ behavior and experience. In a series of 7 studies, Dr. Aron developed and utilized her HSP Scale (Highly Sensitive Person Scale), with findings that identified a core variable of “Sensory Processing Sensitivity” with “High Sensitivity” as an internally consistent construct. She found that approximately 15% to 20% of the population – about 1 in 5 people, or about 50 million people in the United States --- share this distinct personality trait. According to Dr. Aron’s definition, a highly sensitive person (HSP) has a more sensitive nervous system, is acutely aware of more subtleties in their environment, is more easily overwhelmed when in a highly stimulating situation, is easily affected by other’s moods, and is deeply creative and moved by arts and music. The key quality, when compared to the 80% without the trait, is that HSP’s process everything around them in much greater detail, elaborating on every possibility and making inventive associations. While this cognitive processing is not always fully conscious, it can surface as intuition.

So, why are so many artists highly sensitive people? Dr. Aron tells us that HSP’s have an inborn sensitive temperament, and along with other traits that make up the creative personality, including layers of depth, complexity and contradictions, sensitivity appears to be an essential ingredient for artistic expression. Aron’s research subjects were immensely relieved to discover this common trait among many and one person remarked “I felt known, I felt affirmed, and found out that it is not only OK to be sensitive – it’s a gift.”

Since Dr. Aron first published her research on sensory processing sensitivity, later research (Smolewska et. al. 2006; Evans and Rothbart 2008) has demonstrated that Aron’s unidimensional Highly Sensitive Person Scale is a valid and reliable measure of sensory processing sensitivity. Acevedo and her associates (2014) studied the neural foundations of sensory processing sensitivity by using functional magnetic resonance imaging (fMRI) technology to determine whether stronger neural activity would be found in the predicted brain regions in response to both positive and negative social stimuli. Positive findings showed greater brain activation in HSP’s than others in an area called the insula, the part of the brain that integrates knowledge of inner states and emotions, bodily positions and outer events. Mind and body are integrated in the insula, which provides insight into human emotions. The insula is highly involved for HSP’s in attention, empathy, higher order cognitive processing, integration of sensory information, emotional meaning making, the mirror neuron system, and self---awareness.

The Creative Personality

As creativity researcher Csikszentmihalyi (1996) described in his book Creativity: The Work and Lives of 91 Eminent People, creative people demonstrate patterns of thought and behavior that in most other people are segregated. Creative individuals contain contradictory extremes, and instead of being an “individual, each of them is a multitude”. He outlines the 10 paradoxical traits often present in creative individuals that are integrated with each other in a dialectical tension. Three of these seemingly contradictory personality traits – openness/sensitivity, energy/rest, and extroversion/introversion, are linked to what Elaine Aron (1996) refers to as the Highly Sensitive Person (HSP). These traits are not discrete phenomena but are intricately related to one another and along with other traits form the essence of the creative performer’s personality. Indeed, some of the most creative people have very high levels of sensitivity. The contrast of openness and sensitivity

makes creative people vulnerable to suffering, but also available to experience a vast array of enjoyment. Csikszentmihalyi (1996) concludes that one word can summarize what makes creative individuals different from others – it's *complexity*. However, eminence “invites criticism and often vicious attacks”. For the artist who has invested years in producing art it can be devastating if nobody cares. Yet perhaps the most difficult experience for creative artists is the sense of loss and emptiness when they can't work and fear their creativity is gone. Csikszentmihalyi (1998) describes the opposite state in the artistic experience of *flow* when the artist is intensely engaged, working in the area of their expertise, where all worries fall away and are replaced by a sense of bliss. This prominent quality, that is most consistently present in creative individuals, is the ability to enjoy the process of creativity for its own sake.

Implications for Treatment

It is becoming clearly evident that there is a relationship between psychopathology and creativity. Many creative individuals do not suffer from mental illness, and most people who are mentally ill are not especially creative. However, the compelling evidence shows that there is a disproportionate rate of psychopathology, especially bipolar disorder, in highly creative individuals. So what are the implications for the clinician who is caring for the creative artist struggling with symptoms along the bipolar disorder spectrum? And how do we understand and develop strategies for alleviating the stresses accompanying Sensory--Processing Sensitivity and creative activity? It is essential to integrate medical and psychological approaches. Goodwin & Jamison (1990, 2007) discuss the central issue in psychological management of bipolar patients as medication compliance, including the efficacy of lithium (as well as other medications such as antidepressants and anticonvulsants) for both depressed and manic patients, and the quality of prophylactic response. They also stress that bipolar illness can be lethal and emphasize that the best approach to preventing suicide is the effective treatment of the underlying illness. As clinicians we see highly creative individuals who are reluctant to seek treatment because of the stigma associated with mental illness. Creative individuals can also view their emotional problems as part of the price that they must pay for being too sensitive, for having an artistic temperament and leading a creative lifestyle. Many artists see emotional experiences as essential to their identity as creative or performing artists, and many will express their misgivings that psychiatric treatment will compromise their ability to create (Goodwin & Jamison, 1990, p. 364).

Daniel Siegel tells us in *The Mindful Brain* (2007) that experience can create structural changes in the brain, and this phenomenon called *neuroplasticity* occurs when new neurons grow in the brain. Neural integration, the large--system view of how the brain functions, is influenced by the coordination and balance of neural activation. In *Mindsight* (2010) Siegel shows us how to observe our own minds at work – why we think, feel and act the way we do – and how we can literally change the wiring and architecture of our brains. Mindful awareness and mindfulness practices (such as Mindfulness Meditation) are forms of experience that appear to promote neural plasticity. Healthy lifestyle practices, such as a balanced diet, regular exercise, and sleep can set the foundation for promoting neuroplasticity. For our purposes, Siegel explains (2007) that affective styles appear capable of being shifted by mindful awareness practices toward resilience, including the capacity to rebound from negative affective states. Mindfulness requires the individual to develop the skill of perceiving sensory experience with a keen focus on nonverbal experience. This intuitive observation of one's sensory experience is crucial for understanding how the mind might be “drowning beneath waves of anxiety or depression” (p. 279). Knowledge of the nature of these sensory processes allows one to disengage the mind's stormy activity. Psychotherapeutic approaches that teach mindfulness practices enable the patient to utilize these skills to promote self--control, an overall sense of well--being, and physiological health. Blumberg and associates' (2004) proposal about bipolar disorder suggests that in patients coping with bipolar disorder “the neural circuitry connecting the ventral lateral prefrontal cortex to the limbic amygdala is deficient”. This is part of the same circuitry uniquely harnessed in individuals who practice mindfulness with

such regularity that it has become a trait. A number of studies have shown that mindfulness practices, specifically Mindfulness-Based Stress Reduction and Mindfulness Meditation (Kabat-Zinn, 1990, 2003; Davidson et al. 2003), can improve anxiety, depression, immune, cardiac, psychosocial and interpersonal functioning.

Holistic and adjunctive therapies are essential to healing the whole artist, and developing comprehensive treatment plans focused on the individual needs of each artist is the evolving treatment model for the care of performing artists (Colvin, 2015).

Final Thoughts

In considering the fragile balance of life and making art, we can empathize with Elton John's suffering, as he describes a dark period in the 1980's while he battled serious depression and drugs. When asked by the interviewer (CBS Sunday Morning 2015) how he kept going he replied "I did -- and that's what kept me alive. If I would have stayed at home, and just shut my curtains, and not appeared for six months, I would not have appeared period, because I would have killed myself. The fact is that music kept me alive – it saved my life."

Being a creative artist in our society takes tremendous perseverance and courage. It means being your unique self with all its confusing contradictions, risk-taking and discoveries of the discipline necessary to develop as an artist. The external rewards may be few, and if they come they will likely be delayed. Yet, the internal rewards can show up daily in the blissful state of making art for the sheer pleasure of doing it. Those of us involved in the field of educating and caring for the performing artist must also struggle, and continue to discover strategies and techniques to assist the artist in their creative endeavors with all its' messy, paradoxical twists and turns, and then the evolution of a special beauty.

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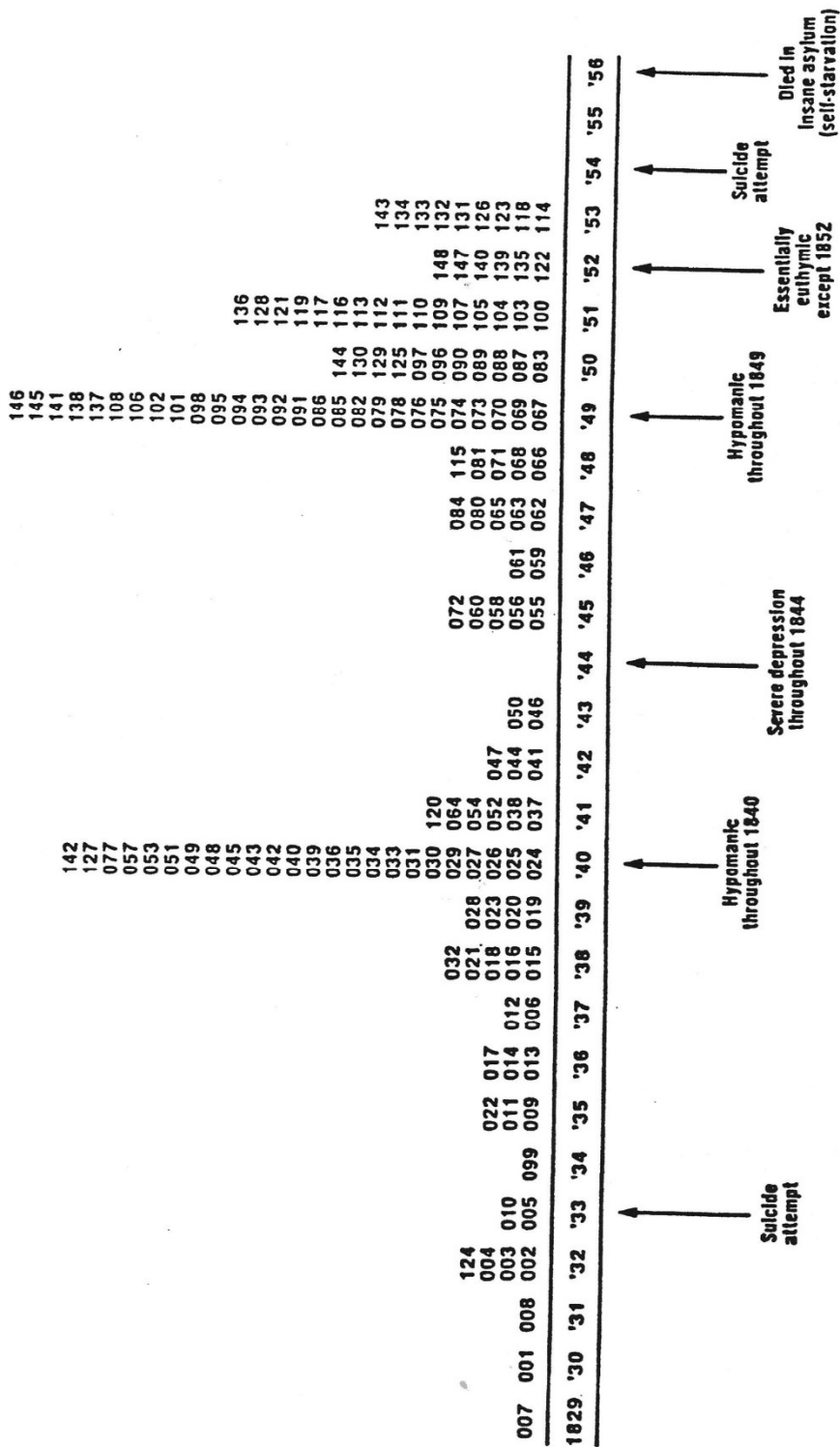
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Schumann's Works by Year and Opus Number

FIGURE 1



(Adapted from Slater and Meyer, 1959)

ADDICTION AND RECOVERY: AN OVERVIEW

State of the Art Review

PAMA/NASM Task Force on Psychological Health

Susan D. Raeburn, PhD

Introduction

Whatever your generational viewpoint, there are few health issues that stir controversy as predictably as those related to the use and abuse of alcohol and drugs. What is not open to question is that the consequences of substance use disorders represent significant human and financial costs to college students, their families, and their communities.

This picture has become increasingly complicated as other mind-altering and potentially addictive behaviors (for example, gambling, Internet pornography, binge-eating, and Internet gaming) have joined the party. Often substance abuse interacts with addictive behaviors. The stakes continue to get higher as the negative consequences of college students prescription opiate and heroin abuse are sadly making headlines in the national press. And, as we know, the politics surrounding medical marijuana, legalization, and the failing War on Drugs in the larger culture are just getting started.

Patterns of use related to alcohol have been the most frequently studied over time so let us begin with that by way of example.

The National Institute on Alcohol Abuse and Alcoholism (NIAAA) describe harmful and underage college drinking as a significant public health problem (1). For example, recent NIAAA estimates indicate that almost sixty percent of college students (ages 18-22 yo) drank in the last month and two out of three of them engaged in binge drinking. Binge drinking is generally defined as a pattern of drinking equivalent to five drinks in a two hour period for men and four drinks for women. It is known to be harmful to the brain as well as to the liver and other organs.

A national survey on substance use and health listed college student drinking related consequences for the year, as follows (2):

1,825 deaths of college students (usually from alcohol-related unintentional injuries, including motor vehicle accidents);

696,000 assaults by another student who had been drinking;

97,000 drinking related sexual assaults or date rape; and,

25 % of college students reporting drinking-related negative academic consequences.

Other consequences included suicide attempts, health problems, injuries, unsafe sex, vandalism, property damage and police involvement.

College Music Students

As is often emphasized for better or worse in the media, the association between substance abuse and musician culture runs deep. Although it is still the case that the prevalence rates of diagnosable substance use disorders for musicians have not been adequately determined, the available surveys do suggest that musicians across genres self-report substantial substance abuse problems (3,4,5,6).

Coupled with the fact that young adults between the ages of eighteen and twenty-five use substances more than any other age group (2), this is a relevant issue for college music students even as members of the general public. All things considered, the issue of how college music students become socialized into the profession of musician related to substance use and self-care is vital. The developmental transitions experienced by young adults as they enter college may also provide an important “window of opportunity” for intervening on their future ways of thinking and behaving around alcohol and drugs.

What Is Addiction?

“...If an organism is stuck in survival mode, its energies are focused on fighting off unseen enemies, which leaves no room for nurture, care, and love. For us humans, it means that as long as the mind is defending itself against invisible assaults, our closest bonds are threatened, along with our ability to imagine, plan, play, learn, and pay attention to other people’s needs.”

Bessel Van der Kolk (7)

The quote above was written about adaptation to stress and trauma. It captures something essential about what it is like to suffer from addiction. Fortunately, there is a way out of that suffering which we will name recovery. People get addicted but recovery is possible through establishing connection with something greater than the self. Creativity, trustworthy people, service to others are some of the ways in which people successfully recover. As with all problems, primary prevention is the first goal.

The American Society of Addiction Medicine defines addiction as a stress-induced, genetically-mediated primary, chronic and relapsing disease of reward, motivation, memory and related circuitry that alters motivational hierarchies such that addictive behavior supplants healthy, self-care behaviors. Dysfunction in these circuits leads to characteristic biological, psychological, social and spiritual manifestations. This is reflected in an individual pathologically pursuing reward and/or relief by substance use and other behaviors (8).

While discussions of addiction have historically addressed the use of mind-altering substances such as alcohol and drugs, increasing attention is now being paid to mind-altering behaviors. Rather than a person “getting a buzz” only from ingesting an external substance such as alcohol, opiates, or cocaine, neuroimaging technologies and research is demonstrating that mind-altering behaviors related to sex, gambling, shopping and hyper-palatable foods impact the brain’s reward pathways and can also become addictive (9,10,11,12).

Pathological gambling is to date the only “process” addiction that has been deemed adequately studied to warrant a formal diagnosis in DSM-V (13). While the Chinese government has defined the compulsive playing of Internet games an addiction, Internet Gaming Disorder has been included in DSM-V as “a condition warranting more clinical research and experience before it might be included as a formal diagnosis.” Hypersexual Disorder did not make the cut during the last revision of DSM-V but there is a growing community of clinicians recognizing the problem of sex addiction (9).

Statistics on College Student Use of Alcohol, Marijuana, Opiates, Stimulants, Nicotine, Porn, Gambling, Internet Gaming, Binge Eating

Traditionally, individuals in the 18-24 year old group have relatively high prevalence rates for the use of almost all substances (DSM-V, 13). Substance use generally begins in the teens. Within that statistic,

however, are various use trends over time. For example, the National Institute on Drug Abuse (NIDA) monitors statistics through the Monitoring the Future Survey conducted by the University of Michigan (14). Here are some findings from 2014:

Alcohol - 35% reported binge drinking in the last two weeks. 42.6 % reported being drunk in the past month. 4.3 % report drinking daily. NIAAA estimates that 20 percent of college students meet criteria for an alcohol use disorder. Some students seem to out grow this while others continue and develop severe use disorders.

Marijuana - 5.9 % report smoking marijuana daily (more than drinking daily). Daily marijuana use is at it's highest level in three decades.

Heroin/Opiates - The number of people using heroin in the US has been rising since 2007 and this trend appears to be driven primarily by 18-25 yo adults who have had the largest increases. 18-25 year olds seeking treatment for heroin abuse rose from 11 % of total admissions in 2008 to 26 % in the first half of 2012. Nearly half of the young people surveyed in recent studies who now use IV heroin said that they used to use prescription opiates (which got harder to obtain and more expensive) (15).

Stimulants - 9.6 % of college students reported using Adderall without medical supervision during the year and 4.4 % used Ritalin. 4.4 % reported using cocaine in the past year (up from 2.7 % in 2013). Amphetamine use (including the above) nearly doubled between 2008 and 2013.

Nicotine - 12.9 % reported smoking cigarettes in the past month. 9.7 % reported using e-cigarettes.

Dr. Nora Volkow, Director of NIDA , reports that the most recent findings from the Monitoring the Future Survey of 12th graders in 2015 found that drug use was generally remaining stable or decreasing but still remained unacceptably high.

Pornography - Estimates of college student use of porn vary, but are generally high and higher for men than women. One study of 500 found that roughly 67 % of young men and 49% of young women agreed that viewing porn was acceptable but 87% of young men and 31% of young women actually viewed it. (16)

Another study of 379 college students found that 21% of the men and 6.7 % of the women were at risk for addictive sexual behavior and would benefit from additional screening (17).

Gambling - Recent research suggests that about 6 % of college students in the U.S. have a serious gambling problem. Consequences include psychological problems, unmanageable debt, and failing grades. In addition, gamblers are more likely to binge drink, abuse drugs. Males have a higher prevalence of gambling than women (12).

Internet gaming - DSM-V (13) indicates that the prevalence of Internet gaming disorder remains unclear in the U.S. but appears to be the highest in Asian countries amongst 12-20 year olds. One Asian study found that 8.4 % males and 4.5 % of females (ages 15-19) had the disorder.

Binge-eating - DSM-V now includes Binge Eating Disorder as a legitimate diagnosis. Prevalence is cited at 1.6% for adult females and 0.8 % for adult men and is “common in adolescent and college-age samples.” After decades of eating disorder researchers concluding that BED not be considered an addiction, some notable experts such as Dr. Kelly Brownell at Yale are considering animal research showing that certain “hyper-palatable” foods affect the reward pathways in the brain like drugs of abuse (10,11). In any event, obesity is a related health problem for college students.

Formal DSM-V Criteria: Substance Use Disorders (Mild/Moderate/Severe)

In 2013, the Diagnostic and Statistical Manual of Mental Disorders (DSM-V) changed the previous criteria for diagnosing problematic alcohol and drug use. Rather than “abuse and dependence,” DSM-V established criteria for “Substance Use Disorders - Mild/Moderate/ Severe preceded by the name of the specific substance. For example “alcohol dependence” is now “alcohol use disorder- moderate or severe.” (13)

With the level of severity now measured by the number of criteria endorsed, here are the eleven formal criteria:

- 1) Substance taken in larger amounts over a longer period than was intended
- 2) Persistent desire or unsuccessful attempts to cut down use
- 3) Great deal of time spent in activities to obtain the substance, use, or recover from its effects
- 4) Craving, or strong desire to use the substance
- 5) Failure to fulfill requirements at home, work, or school due to recurrent use
- 6) Continued use despite social or interpersonal problems brought about by substance use
- 7) Social, recreational, or occupational activities are given up or reduced because of use
- 8) Recurrent use in situations which are physically hazardous
- 9) Continued use despite knowledge that the substance is causing or exacerbating recurrent physical or psychological problems
- 10) Tolerance (a need for increased amounts to get the same effect)
- 11) Withdrawal symptoms

Endorsement of :

- 2-3 symptoms = Mild use disorder
- 4-5 symptoms = Moderate use disorder
- 6 or more symptoms = Severe use disorder.

Legal consequences of substance use was eliminated as part of the formal diagnostic criteria of DSM-V. However, such consequences often remain clinically significant in impacting motivation to change.

Self-administered Tools to Assess Levels of Use

A standardized but less formal way to consider someone’s level of concern about substance use or sexual behaviors may be found in a number of brief, self-administered questionnaires. Many additional instruments may be found online through the websites of the National Institute of Alcohol Abuse and Alcoholism (NIAAA) or the National Institute of Drug Abuse (NIDA).

For alcohol use and abuse, the CAGE is a well-established tool (18):

The CAGE Questionnaire

Have you ever felt you should **C**ut down on your drinking?

Have people **A**nnoyed you by criticizing your drinking?

Have you ever felt bad or **G**uilty about your drinking?

Have you ever had a drink first thing in the morning to steady your nerves or to get rid of a hangover (**E**ye opener)?

Scoring:

Item responses on the CAGE are scored 0 or 1, with a higher score an indication of alcohol problems. A total score of 2 or greater is considered clinically significant.

DAST-10

For drug use and abuse, the DAST-10 was developed by Harvey Skinner (1982) at the Department of Public Health, University of Toronto.

This questionnaire has ten self-administered items for adults and older youth. Scores from 1-2 are considered low level with no suggested action; scores from 6-10 are considered substantial to severe triggering a suggested action of “intensive assessment” (19).

PATHOS

Although the proposed diagnosis of Hypersexual Disorder was not included in the DSM-V, problematic sexual behaviors represent a growing concern for young adults, particularly the compulsive use of Internet pornography. Hence, another self-assessment tool, the PATHOS, is included here, referencing problematic sexual behavior (20).

PATHOS is an acronym for the six items of this tool:

- 1) Do you often find yourself preoccupied with sexual thoughts? (Preoccupied)
- 2) Do you hide some of your sexual behavior from others? (Ashamed)
- 3) Have you ever sought help for sexual behavior you did not like? (Treatment)
- 4) Has anyone been hurt emotionally because of your sexual behavior? (Hurt others)
- 5) Do you feel controlled by your sexual desire? (Out of control)
- 6) When you have sex, do you feel depressed afterwards? (Sad).

Using a cutoff score of three, PATHOS is seen as a useful way to identify individuals who might benefit from further assessment.

Cashwell et al (2015) piloted the use of this six item tool with 379 college students and concluded that a substantial number (21% of the men and 6.7 % of the women) were at risk for addictive sexual behavior and would benefit from additional screening (16).

Established Risk Factors for Developing an Addiction

- Adverse Childhood Experiences/Family History of Addiction/Trauma

In 1998, Kaiser Permanente physicians, Vincent Felitti and Robert Anda (21) and their associates published ground breaking research on the relationship between experiencing childhood emotional, physical, or sexual abuse (“Adverse Childhood Experiences”) and adult health risk behavior and health outcomes.

They found that the majority of their participants had indeed had such experiences, previously undisclosed, and that people who had reported four or more had a four to twelve-fold increased risk of adult alcoholism and substance abuse as well as suicide and depression.

One of the adverse childhood experiences was parental addiction. Dr. Nora Volkow, Director at NIDA estimates that about 50 % of a person’s vulnerability to addiction is genetic so family history of addiction has traditionally been seen as a major risk factor for becoming addicted. Gabor Mate, M.D., on the other hand, emphasizes that people vary as to how sensitive they are to their genetic profile and that ultimately, stress and trauma have a major impact on that expression (22).

- Early Onset of Use

Starting to drink or use before age 14 increases risk by an estimated 400%. When initial use of mind-altering substances or behaviors like gambling or pornography start early, when the brain is still in significant development, the risk for becoming addicted increases exponentially. Early onset of use remains one of the most reliable indicators of addiction problems in the future.

- Personality with high sensation seeking, impulsiveness, disinhibition
- Pre-existing mental illness (especially untreated)
- High levels of chronic environmental stress.

The Developmental Process of Addiction and Recovery

Not all addicted people have family history of addiction or even adverse childhood experiences. Some people drink or use their way into compulsive behavior over time. Addiction is indeed a bio-psycho-social (and perhaps spiritual/existential) syndrome with many moving parts for any given individual.

It is common for people to enter and exit different levels of use depending upon life circumstances, sometimes fluidly and rapidly moving up and down what has been called the abuse continuum. While initially modeled on earlier DSM diagnostic categories, the levels of the abuse continuum remain equally relevant for illustrating the process aspect of change. Please note that the abuse continuum requires modification when the addictive behaviors involve food and/or sex where “abstinence” may reflect anorexic patterns that are part of the disorder.

The following levels of use are found along the abuse continuum:

- Abstinence (no use)

- Social Use (so infrequent that there is no active pattern)
- Habitual Use (use becomes a regular pattern but at varying levels)
- Abuse (negative consequences of use begin but person continues use)
- Dependence (negative consequences is joined by increasing loss of control over use).

Helping students identify their patterns of use in a non-shaming way is often a helpful beginning to a productive dialogue.

The Recovery Process: Stages of Change

After decades of studying how people change a variety of addictive behaviors, researchers James Prochaska and Carlo DiClemente developed a model that has been very influential in the addiction field. Formally called the Transtheoretical Model of Change, it is usually referred to as The Stages of Change (23).

The five stages of change are identified as follows:

- Pre-contemplation- you do not believe that you have a problem (even if others think you do) and you have no intention of changing in the foreseeable future.
- Contemplation - you think that you might have a problem but are not ready to do anything about it right now.
- Preparation - you acknowledge that you have a problem and are gearing up to do something about it.
- Action - you begin to make significant changes in your behavior to address your problem. You have some setbacks but you keep learning how to overcome them.
- Maintenance - your new recovery behaviors and ways of thinking stabilize over time (six months of stability meets the definition of ‘maintenance’) and becomes integrated into other areas of your life.

A person’s movement through the stages of change is often described as a spiral action - akin to “three steps forward and two steps backwards.” When the return to addictive behavior is temporary, clinicians refer to it as a “lapse” and encourage their clients to learn from it rather than shame themselves which increases the probability of continuing to use. Indeed, recovering people are encouraged to learn “relapse prevention” strategies.

When the person “stays out” (continues to use), revisiting the earlier stages of pre-contemplation or contemplation, that is referred to as a full-blown “relapse.”

In the early stages of change, motivational enhancement is a preferred approach in which therapists work to meet the clients where they really are rather than trying to force them into a later stage of change (24). William Miller and his colleagues at the University of New Mexico developed this approach using “motivational interviewing” describing it as a person-centered, goal-oriented approach for facilitating change through exploring and resolving ambivalence.

Another well-established development in the field, initially coming from the field of public health and championed by Dr. Pat Denning, is “harm reduction” which fundamentally meets clients where they are in choosing their goals regarding substance use without requiring abstinence (25).

Early Recovery/ Ongoing Recovery

It is often helpful to differentiate the tasks of early recovery from the later tasks of ongoing recovery for the newly sober person. In early recovery, abstinence is established “one day at a time”, using detox or anti-craving medications when necessary. Some individuals require the structure of a formal inpatient or outpatient recovery program. Others succeed with the help of supportive friends and family or self-help programs such as 12 Step (i.e., Alcoholics Anonymous, Sex Addicts Anonymous, Gamblers Anonymous and so forth) or secular programs like LifeRing. In formal treatment programs, group therapy using cognitive-behavioral techniques are suggested to help identify feelings and challenge distorted beliefs (“stinking thinking”), to decrease isolation, to begin to build life skills (“recovery tools”), and to increase daily structure and social support. Learning how to challenge denial and practice rigorous honesty with self and others is emphasized.

Ongoing recovery builds on the foundation of early recovery but emphasizes the development of secure connections, self-awareness, emotional authenticity, improved self-regulation and self-care, and interpersonal communication. With ongoing sobriety the recovering person has the opportunity to resolve family-of-origin issues that may have been holding them back from living a fully expressive life. One gets to fully develop his or her gifts and experience genuine gratitude.

Conclusion

Maximizing the health and minimizing the suffering of college music students around substance use and other potentially addictive behaviors seems best approached by following the evidence-based, multi-level interventions available through organizations such as the National Association of Alcohol Abuse and Alcoholism. You do not have to start from scratch. Interventions have been developed for students, for faculty, for college administrators, for parents, and for communities. Once again, beginning with interventions for college drinking may offer a roadmap to be applied to other parts of the abuse spectrum. Ultimately, the advice given to people in recovery about staying honest, establishing structure, and maintaining support for themselves may be well applied to this task as well. It really does take a village. Let’s create one.

NIAA A has studied various strategies for addressing college student drinking problems and makes what they have learned easily available through what they call the *CollegeAIM guide* (i.e., *College Alcohol Intervention Matrix*). They focus on strategies targeting individual students including education and awareness programs, cognitive-behavioral skill development, motivational enhancement, and referrals to health professionals for assessment and treatment when appropriate. Other environmental strategies target the student body as a whole and the surrounding community. The CollegeAIM guide rates numerous alcohol interventions on factors such as costs and effectiveness so colleges do not have to reinvent the wheel or waste time and money on strategies that have been shown not to work.

The NIAAA states: “ The greatest chance for creating a safe campus will likely come from a combination of individual-and environmental-level interventions that work together to maximize positive effects. Strong leadership from a concerned college president, in combination with an involved campus community and a comprehensive program of evidence-based strategies, can help address harmful student drinking.”

Go to www.collegedrinkingprevention.gov/CollegeAIM

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MINDFULNESS PRACTICEⁱ

State of the Art Review

PAMA/NASM Task Force on Psychological Health

Vanessa Cornett-Murtada, DMA, CHt, CMI

When translated directly from Sanskrit, the word *mindfulness* means simply “awareness.” In our culture, the term usually refers to the intentional direction of attention, without judgment, to the present moment. Despite the apparent simplicity of this concept, it is worth noting that it is extremely rare for people in Western culture to practice mindfulness during a regular workday. Much of what we do is performed by the body while the mind is elsewhere, perhaps multitasking, or perhaps dwelling on something in the past or in the future. The proliferation of personal computers, wireless devices, and other gadgets has made functioning on “auto-pilot” the norm rather than the exception. Directing the attention to a focal point in the present is easy to experience but much more difficult to put into regular practice. The purpose of mindfulness practice is not to control the thoughts, but simply to notice them without getting caught up in them. In putting a subtle distance between our experience and our thoughts about the experience, we can become a detached observer of our own mental activity. In the words of Bhante Gunaratana, “There is a difference between being aware of a thought and thinking a thought.”ⁱⁱ

Musicians will find it quite easy to make a connection between and a typical performance experience. As we perform, we strive to direct our thoughts to each musical moment as we create it. Yet the continuous stream of thoughts in the back of our mind may offer salient or unwanted opinions and critiques of recent mistakes or slips, or offer apprehension about difficult passages to come. What if we were able to stay focused in the present moment, and accept without judgment every note, regardless of its beauty or even its accuracy? What if we were able to acknowledge mistakes, even big ones, with noncritical awareness, always redirecting our attention back to the music itself? The beautiful irony is that, although mindfulness practice during performance can be challenging, music exists only in the present moment. If we fret over a past mistake or worry about an upcoming passage, we are not fully experiencing the sound of music that exists only *now*. Some might acknowledge that it is the same with life itself. As long as we are preoccupied with the past or focused on the future, we are not experiencing life as we know it in this moment.

Most mindfulness practices have their roots in Eastern contemplative traditions, some of which were introduced to Americans during the counterculture of the 1960s. Jon Kabat-Zinn, a pioneer of the therapeutic practice of mindfulness in the United States, founded the Mindfulness-Based Stress Reduction (MBSR) program at the University of Massachusetts Medical Center in 1979. The positive effects of Zinn’s mindfulness programs have been documented for many years, and include a decrease in blood pressure, diminished respiratory rate, lower pulse rate, diminished oxygen consumption, improved immune function, reduced suffering for patients with chronic pain, improvements in symptoms of anxiety and panic disorders, and an overall improved sense of wellbeing. In the last few decades, the popularity of various Buddhist authors such as Thich Nhat Hanh, Jack Kornfield, Pema Chödrön, and the fourteenth Dalai Lama of Tibet has stimulated Western interest in the practice of mindfulness. Perhaps not surprisingly, recent branches of psychotherapy (Acceptance and Commitment Therapy, Mindfulness-Based Cognitive Therapy) have incorporated contemplative traditions into clinical therapy practices. The Mind and Life Institute, founded by the Dalai Lama, strives to promote wellbeing by fostering discourse to find common ground between contemplative traditions and scientific inquiry.

When used for stress reduction and anxiety management in Western culture, most mindfulness practices are based on Buddhist vipassanā (“insight”) meditation. This type of practice emphasizes moment-to-moment awareness, paying attention to events and thoughts that would normally go unnoticed, becoming a detached observer of one’s own thought processes, and having no goal except to observe. It seems apparent that these goals would be particularly helpful to students of the twenty-first century, who are chronically overstimulated, engaged in multitasking through a variety of media, distracted, exhausted, and exhibiting stress-related illnesses at younger and younger ages. I sometimes make it a point to watch the students at my university walk to their classes; more often than not they are talking on the phone, texting, or listening to music as they walk unaware through a beautiful tree-lined campus on the Mississippi River. The act of turning off electronic media and music and simply observing the sights and sounds of one’s surroundings is an excellent mindfulness exercise. In the words of William James, the father of American psychology, “The education of attention would be an education par excellence.”ⁱⁱⁱ Furthermore, most students do not have the opportunity to experience silence of any kind during their waking hours. The irony is that many who would benefit greatly from silent contemplation are performing musicians.

We can make a subtle distinction between mindfulness (awareness) and the practice of meditation. While many would rightfully argue that the two are often one in the same, the term meditation is often used to describe the practice of using contemplation to train the mind for a specific focus, e.g. to cultivate mindfulness. It is worth noting that mindfulness meditation is not the only form of meditation, and that meditation does not need to occur while sitting cross-legged on a cushion amidst a cloud of incense smoke. Almost any activity can be done meditatively, and in fact, walking meditations have inspired people from a number of cultures to create vast labyrinths. For performers suffering from stress or anxiety, the most effective and therapeutic way to practice mindfulness is through short sitting meditations. I believe that, for beginning meditators, 10 minutes is a good time limit for meditation practice. In fact, 10 minutes of focused, mindful awareness can be extremely difficult to do! The goal of practice should not necessarily be to increase the sitting time, but to practice every day if possible.

Current research suggests that the psychological wellness of performers, particularly in the area of anxiety management, can be improved through practice of mindfulness meditation.^{iv} One study in particular posits that a connection may exist between meditation practice and the overall quality of the performance.^v Psychologists at one university discovered that taking breaks in a natural environment improved attention capture, memory, and the ability to concentrate in students.^{vi} In this study, college students were given a list of words to memorize, were asked to walk for one hour in either the campus arboretum or in downtown Ann Arbor, Michigan, and then were tested on how many words they could recall from the list. Researchers discovered that the group of students who took a walk in the campus arboretum outperformed the other groups on the memory test. Surprisingly, students who simply viewed a *photograph* of a serene natural environment also outperformed their peers, suggesting that an image of nature can have the same effect on attention. It is possible that a quiet, natural environment (even one suggested by a photograph) encouraged a state of reflective mindfulness in these students. Additionally, in a study of Chinese students, meditation training led to improvement in memory function as well as reduced anxiety, stress, depression, fatigue, and levels of the stress hormone cortisol.^{vii} According to attention restoration theory, sustained mental effort produces fatigue and leads to a reduction in systemic glucose. Attention state training techniques, such as mindfulness meditation, replenish glucose supply which improves performance.^{viii} Most would agree that the gentle process of focusing the mind would make it easier for a performer to quiet the critical conscious mind, paving the way to positive flow experiences.

Csikszentmihalyi’s belief that flow states and the quality of life depend on a person’s ability to control what happens in his or her consciousness is, to this author, similar to the practice of observing and directing the thoughts in mindfulness meditation. While the goal of mindfulness is not to control one’s thoughts, a performer who practices meditation can learn to consciously direct her awareness at will,

rather than being at the mercy of what happens to catch her attention while on stage. In Csikszentmihalyi's words, "Since what we experience *is* reality, as far as we are concerned, we can transform reality to the extent that we influence what happens in consciousness."^{ix} Most well-prepared musicians do not need to struggle to remember their music or the technique required to perform well while on stage. Often they simply need to be able to focus their concentration and gently direct their awareness to the art of expressing themselves through their music.

Awareness is the very root of human experience. Truthfully, one of the greatest abilities possessed by humans is that of meta-cognition. We are the only animals on earth who can observe our own thinking, and who can deliberately change the direction of our awareness if we wish. In fact, each moment we choose to devote ourselves to something, and we do so with our awareness. Just as we can cultivate the ability to perform a rapid arpeggio or read complex music notation at sight, we can train the mind to be a powerful tool for good psychological health. If the mind and body work together to create optimal performance experiences for musicians, then I believe that the majority of performers neglect much of the training of the mind in favor of repetitive practice at their instruments. Consider that we have about one hundred billion brain cells at our disposal, and more possible neural connections in one human brain than atoms in the entire universe. If these neural connections can be built up through repetition or broken down through neglect, then we can train our mind as easily as we can train our fingers and voices.

Carl Jung believed that wholeness is achieved by integrating the opposites in oneself. In using contemplative practices such as mindfulness meditation, we are joining the outer world of physical technique and the personality with the inner world of the silent observer. Or, perhaps we are uniting the Western world of competition and achievement ("doing") with traditional Eastern philosophies of awareness and acceptance ("being"). This sort of integrated teaching could be the very essence of music pedagogy in this new millennium.

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Some Online Resources

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3. The Center for Contemplative Mind in Society contemplativemind.org
4. International Symposia for Contemplative Studies contemplativeresearch.org
5. Mind and Life Institute mindandlife.org
6. Mindfulness in Education mindfuleducation.org

ⁱ The text for this paper was extracted from V. Cornett (2012 Sept), Nurturing the whole musician: Mindfulness, wellness, and the mind-body connection. *Music Teachers National Association (MTNA) e-Journal*, 15-28.

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THE ROLE OF STUDENT HEALTH SERVICES

State of the Art Review

PAMA/NASM Task Force on Psychological Health

Ralph Manchester, MD

The World Health Organization includes psychological wellness in its definition of health (1), and the biopsychosocial model emphasizes the interrelatedness of physical, mental and social aspects of health for all, regardless of age, gender and other demographic characteristics (2). The main tasks of adolescent development are essentially various types of psychological growth (3) that need to be accomplished in order to make the transition from childhood to adulthood. This process is often divided into three stages: adjustment to one's physical growth and development in early adolescence, understanding oneself as a sexual being during middle adolescence and forming one's own identity (independent from family and friends) during late adolescence. The years of middle and late adolescence usually coincide with the time that aspiring musicians are attending postsecondary schools of music. While it's generally true that good mental health is a prerequisite for optimal achievement in any occupation, this may be especially important for musicians and others in the creative professions. It's difficult to express the emotions of a particular piece of music if the musician is struggling to manage his or her own emotions related to the developmental tasks mentioned above, and the emotions evoked by learning and performing various pieces of music have the potential to trigger issues that are of personal importance to the student.

We know quite a bit about the mental health of college students in general, and at least some of that applies to college-level music students. The American College Health Association's National College Health Assessment (NCHA) is a comprehensive health questionnaire that has been used by hundreds of colleges and universities to collect self-reported data on a wide range of physical, mental and social health parameters (4). It has been administered to over a million college students in the USA (and a few other countries) since the 1990's. Most participating schools have surveyed their undergraduate students, although graduate students have been included as well at a few (5). Findings over the years have been quite consistent, with mental health concerns ranking high on the list of health problems that cause distress and interfere with academic performance. Current anxiety and depression are reported by 14 and 12% of college students, respectively, and 5% report having seriously considered suicide in the last 12 months. Relationship issues (with family and/or peers) and also a common concern for college students, and a significant minority of students report issues related to gender identity and sexual preference. Substance abuse is also fairly common, with 35% reporting "binge drinking" (consuming five or more drinks in a few hours) in the last two weeks and 18% reporting use of recreational drugs, mostly marijuana, in the last month. Misuse of prescription drugs, especially the central nervous system stimulants used to treat attention deficit disorder, is also fairly widespread.

We have less information about the mental health problems that are experienced by music students, but research has shown that undergraduate music students are by no means immune to psychological distress (6). At a few schools, music majors tend to use mental health services at a higher rate than other students. However, we don't have good data on to confirm this across multiple schools or to determine whether this is due to a higher burden of mental health concerns or a lower threshold for seeking help.

Fortunately, most North American institutions of higher education that offer a music degree have some type of health services available to their students on or near campus. The emphasis, however, must be on the term "some type" – student health services vary greatly from one school to another. Smaller schools may have a single nurse who is on campus weekdays during regular business hours while classes are in

session. Larger universities often have a comprehensive student health center that is open seven days a week, year-round with an interdisciplinary staff and onsite pharmacy, lab and other ancillary services. Staffing most often consists of primary care physicians, nurse practitioners and physician assistants along with registered nurses, licensed practical nurses and clinical support staff. (Mental health professionals, who may be part of the student health service or may work in a separate counseling center, are discussed below.) Some student health centers also have other health professionals on staff, such as health educators, physical therapists, physicians with subspecialty training and even dentists. Larger student health programs often provide after-hours access to care via an on-call physician, and smaller programs may offer free access to an on-call nurse.

Different schools use different funding models for their student health programs, and this almost always has some effect on how students use the services that are offered. Some institutions simply charge a health fee that every student must pay, and the money collected covers that cost of most or all of the care provided. Other schools fund the student health program from money collected for tuition; this may appear to be the same to the student, and both are essentially a “capitated” financing plan. In recent years, more schools have been trying to fund their student health programs by billing insurance companies for the services they provide, which is the traditional “fee-for-service” approach; and a number of schools apply a hybrid methodology, assessing a health fee to cover the cost of seeing a doctor or nurse but billing insurance for laboratory tests, medications and other ancillary services. On some campuses, health care services that are offered in the student health center are funded one way, while mental health care provided in a counseling center is funded differently. Requiring students to pay out-of-pocket or to arrange for reimbursement from their health insurance plan will in some cases present a barrier to care. Very little research has been done on how frequently this causes problems.

Many (but not all) schools in the USA have some type of student health insurance requirement, although the specifics vary widely. Even since the enactment of the Affordable Care Act, young adults have the highest rate of being uninsured of any demographic group in this country. The number of uninsured domestic students has decreased since it became possible for those under 26 to stay on their parent’s insurance, but thousands of both domestic and international students still have to find other insurance options. Even the most comprehensive student health centers do not provide or pay for hospital care, major surgery and complex out-patient procedures, so health insurance is a must if students are to get the care they may need and avoid financial ruin. While most undergraduate students can, in theory, remain on a parent’s plan (if the parent has insurance), that plan may or may not cover the cost of certain types of care outside the community/area where the insured parent lives. In addition, students are sometimes reluctant to use their family’s insurance plan due to likelihood that an Explanation of Benefits will be sent to the parents, revealing that the student obtained care, possibly for a sensitive physical or mental health problem.

As mentioned above, mental health services for college students may be provided through the student health service, through a separate counseling service or both. The mental health professionals who work in these settings typically have training in clinical psychology, clinical social work or other mental health disciplines. Psychiatrists may be on the staff of the student health center or the counseling center. Some institutions have an “integrated” student health program (ie, the physical health and mental health components are part of the same entity, with a single director who might report to a vice-president for student affairs or other senior official). Others have two separate departments, with the director of each reporting to a senior official. In most cases, this distinction is transparent to students, as long as there is effective communication and coordination of care between those who are wearing the “physical health hat” and those who are wearing the “mental health hat”. In fact, the primary care staff is often providing much of the care for psychological health issues; this is true both on college campuses and in the “real world” as well.

Most college mental health services provide time-limited individual counseling along with some group therapy and evaluative services. On most campuses, students who need long-term individual counseling

are referred to outside therapists. Individual counseling sessions within college health services may be based on cognitive-behavioral therapy, psychodynamic therapy or other methods. Counseling center staff may have more or less experience working with music students and specific topics such as performance anxiety. Primary care providers can evaluate students with performance anxiety and determine whether or not a beta-blocker prescription is appropriate. Treatment for eating disorders is often available, and a number of schools have an interdisciplinary eating disorders team that includes mental health professionals, doctors, nurses, dietitians and others. Students who have substance abuse problems (typically alcohol and/or marijuana-related) may be able to work with a counseling center staff member who has expertise, but students with more serious drug abuse problems (eg, cocaine or heroin) are usually referred to off-campus programs. Testing for ADHD is available on some of the larger campuses, but it's typically not covered by the health center/counseling center budget.

Students usually make their own decisions about when and how to access mental health services, but in some situations they may be asked by the school (typically through the dean of students office) to be seen by one of the counseling center staff. Under these circumstances, the counseling center is acting on behalf of the school, and this is made clear to the student. Concerns can be raised by faculty, staff or fellow students due to changes in behavior, intoxication, extreme weight loss, etc. A few schools have developed on-line reporting systems that allow a concern to be raised electronically with appropriate in-person follow-up. If the student chooses to start individual counseling after such an evaluation, the counselor who did the initial evaluation would not do the individual counseling.

Every academic year, a few college students (including music majors) find themselves dealing with a mental health problem that is so severe that continuing as a full-time student is impossible or inadvisable. This may be due to an eating disorder that is out of control, depression with suicide attempt, significant substance abuse or untreated schizophrenia, among other problems. In this type of situation, the student may need to take a health-related leave of absence. When this happens, it is important for the institution (working closely with the counseling center staff) to specify the conditions under which the student will be allowed to return. For example, the student might be told that s/he must be engaged in ongoing treatment, must demonstrate the ability to do college-level work and must undergo an evaluation by the counseling center prior to clearance for return.

In some cases, a student with a mental illness may require certain accommodations in order to function effectively. Under the current legal environment in the USA, this decision must be based on specific disability criteria, not directly on the fact that the student has a particular diagnosis. Common requests include postponing a required performance, being assigned to a single room, being allowed to live off (or on) campus and (more recently) being allowed to have a therapy animal in his/her dormitory room. Consultation with legal experts who are familiar with disability accommodations, as the rules and court cases are evolving constantly.

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THE UNIVERSITY OF
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Sound Practice

HEALTH

HANDBOOK

for

Orchestral Musicians

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MAY 2015



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Introduction

You Are Your Instrument!

This book is designed to help explain how the human body functions during musical performance. This will help musicians to better prevent performance-related health issues, as well as understand ways to help manage problems should they arise.

A musician's body and mind must operate at a highly sophisticated level to be able to achieve excellence in music performance. This has led to musicians being described as elite athletes, performing at the highest capacity of human function.

The musician's mind and body forms an integral part of their instrument. There should be a perfect synergy in the interface between the instrument and the performer's body. While most musicians ensure their musical instrument is kept in perfect condition, the same cannot always be said for the performers themselves! Tuning your body and mind is as **important as** tuning your instrument to enhance performance and avoid physical and mental health problems.

Physical and psychological wellbeing provides the foundation for all elite human performance. The professional orchestral workplace is demanding both physically and psychologically; accordingly, musicians require active strategies to optimally manage the occupational, musical, physical and psychological load.

The goal of this work health and safety handbook is to provide basic health information to assist professional orchestral musicians to better understand how to maintain health and well-being. It contains advice on posture, physical condition, psychological health, and playing-related movement (performance biomechanics). Tip sheets with various strategies on how to avoid and manage injuries are contained at the end of the handbook.



Best Health → Best Performance

Pain - What Does It Mean?

Orchestral musicians frequently experience pain due to the high physical demands of hours of daily repetitive playing actions. Pain is our body's way of telling us that something has gone wrong and needs to be addressed.

Don't play through pain!

While experiencing pain is common, it should NOT be considered 'normal' to be in pain. "Playing through pain" is a frequently occurring strategy of injury mismanagement that is a major cause of serious, difficult-to-resolve problems in musicians. A musician with chronic and significant physical or psychological damage resulting from such ill-advised coping techniques places his or her career at risk.

The risk of an injury increases in proportion to exposure to the number and type of risk factors. Commonly, injuries arise following a sudden increase in the volume or intensity of playing, often without adequate recovery periods. The muscle overload may also occur as a result of increased external activities such as manual labour or computer use. Sudden increases in playing load do not provide enough time for muscles to adapt and so they will fatigue and be at a higher risk of damage. Injuries tend to occur in predictable areas such as the neck in violinists or the face in a brass player. An episode of pain brought on by this overload should resolve quickly with immediate appropriate management.

In general, the area injured should be rested, and iced if swollen, for the first 1-2 days. If the injury is not settling, consult a medical practitioner or other health professional to diagnose the injury and advise more specific management.

Mild pain from injuries such as muscle strains that would resolve quickly with appropriate care can become more serious if they are not addressed early. Playing with torn muscles not only increases the likelihood of making the tears worse, but also leads to changes in how you play to avoid hurting these structures. This can be very detrimental to your playing and technique as these avoidance patterns typically become bad habits. Longstanding pain also causes changes in the nerves, with those at the muscle becoming hypersensitive (so it is easier to feel pain) and the brain develops an abnormal representation of that part of the body.

If pain persists – see a doctor or physiotherapist

For more information on managing pain refer to page 22

Warming Up

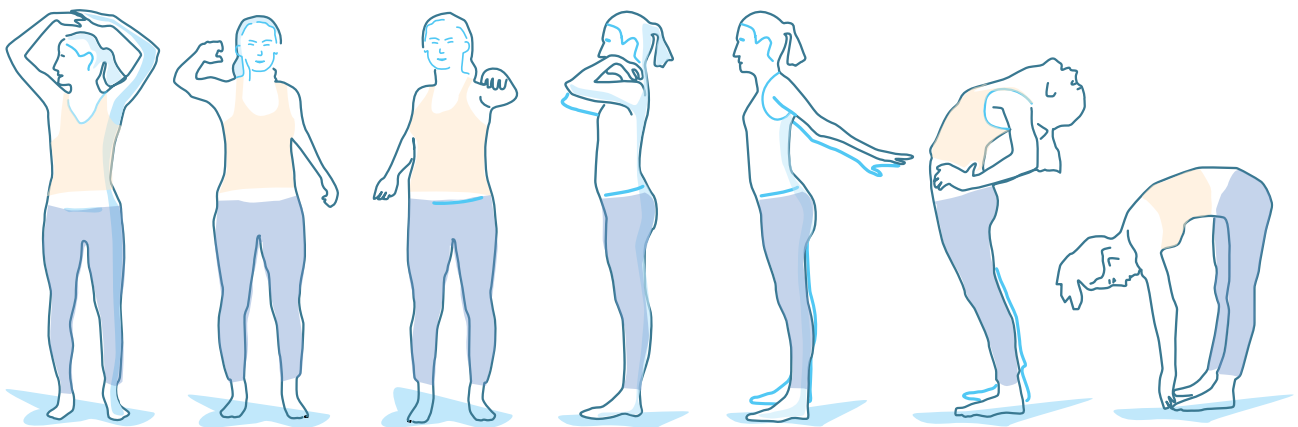
Warming up prepares the body for physical activity. It increases blood flow through the working muscles as well as limbering up the joints that will be moved during playing. Blood carries oxygen and nutrients to the muscles; it takes about 10 minutes to increase flow to more distant body parts like the hands. Muscles with inadequate blood perfusion will initially derive energy from limited local fuel stores within the muscle. However, these local muscle energy stores are best reserved for sudden increased playing loads during performance, such as particularly fast or loud passages. If the stores are used up early, they may not be available when increased demands occur during performance.

Ten to 15 minutes of large and gentle movements of the body, arms and legs half an hour before practice or performance is recommended, followed by a quick upper body warm-up before playing. A physical warm-up is also an ideal time to integrate mental preparation, such as slow rhythmic breathing, imagery and positive focus.

Cooling Down

Once a performance is finished, a cool down should occur. The preferred cooling down exercises comprise gentle, large scale movements, similar to those used in the warm-up, that allow blood to continue to flow through the fatigued muscles to remove waste products and replenish energy stores.

Immediately after the cool-down is the ideal time to drink water and eat foods high in protein and carbohydrates to replenish your energy reserves for the next practice session.



See the Tip Sheet at the back of this book for useful warm-up/cool down exercises.

Stretching & Flexibility

Use it or lose it!

Maintaining flexibility is important for musicians to ensure that the ability to move freely on the instrument is not impaired. If joints are stiff, your muscles may have to work much harder than necessary to move the body part in the desired way.

Try stretching twice a week after warm-up, but not before exercise, to maintain flexibility. There is no convincing research that stretching immediately before exercise prevents injury. Stretching immediately before a performance triggers a stretch reflex in the muscle fibres that causes them to relax, thereby inhibiting one's ability to move quickly and powerfully. This is not an ideal state for launching into the musical repertoire!

The stretch should be gradually taken into range and held for about 30 seconds. Slow breaths help you to regulate the stretch – breathe in for 4 seconds, out for 6 seconds, gently letting the muscle go further into the stretch position with each breath out. This way, a single muscle stretch equals 3 slow breaths per side. A stretch should be felt along the length of the relevant muscle, but should not induce pain. Pain is a signal that something is wrong – the stretch may have gone too far into range; stiff joints may be preventing movement; or the angle of the stretch may be wrong.

Stretching during injury healing helps restore the proper alignment in the recovering body part. Generally, you can stretch further as healing progresses, but a ligament, muscle or tendon that has had a significant tear should not be at full strain for at least 8 weeks. A good indication that you have moved the part too far is pain—if you feel pain, back off!

There are bodywork techniques, such as yoga, Tai Chi and Pilates that may help with flexibility. Many different kinds of yoga exist, with progressive levels within each type. It is important to take care when starting these programs so that you receive good supervision and advice on which variation may best suit your needs.



See the Tip Sheet at the back of this book
for useful stretching exercises

Fit to Play

It is important to be in good physical condition to maximize your body's capacity to provide energy and support for desired musical tasks.

The benefits of exercise training are numerous and include:

1. Improved co-ordination and mobility of joints
2. Reduced fat
3. Increased muscle size and strength or endurance
4. Improved mood
5. Higher energy levels

Cardiovascular fitness

The goal of performance movements is to allow the best sound to be produced with the least possible effort. Increasing cardiovascular fitness levels increases performance capacity by improving the rate of blood supply to a greater number of muscle fibres. Additionally, regular cardiovascular exercise improves mood in addition to enhancing physical capacity.

Resistance training

Resistance training specifically builds up the strength or endurance capacity of a muscle, or a group of muscles. This depends on; the type of exercise given, how much strain the exercise involves, and how many times in a row it is performed. For example, if you lift a weight by bending your elbow, you will strengthen the muscles at the front of your upper arm. They will become bigger and stronger if you lift heavier weights fewer times in a row before getting too tired to lift any more (e.g. 6 repeats), but they will become stronger over time, or have more endurance, if you lift slightly lighter weights more times (e.g. 15 repeats). Generally musicians show better benefits from the latter endurance type resistance training.

Resistance training has specific effects. For example, lifting heavy weights only a few times builds strong muscles for fast, powerful bursts of activity. To increase endurance, lighter weights are used and lifted with a greater number of repetitions until fatigue is experienced. Any weight training should be built up gradually and progressively to avoid straining muscles. For instrumentalists, it is best to focus on supporting or core trunk muscles, not those that are already being heavily used during full playing seasons. Exercises that strengthen the shoulder blade muscles, deep neck muscles and abdominal muscles are beneficial. It is a common error for gym or rehabilitation programs to focus too heavily on the over-worked muscles involved in instrumental performance, such as in the hand or forearm; avoiding this is important.

Exercise training guidelines

The consensus guidelines for exercise participation for normal healthy adults are:

1. Cardiovascular: moderately intense ("somewhat hard") exercise (e.g., swimming, running, fast walking) for 30 minutes a day, 5 days a week OR vigorously intense ("hard") exercise for 20 minutes a day, 3 days a week
2. Resistance: 8–10 strength-training exercises with 8–12 repetitions of each exercise twice a week focussing on underused or supporting muscles. Several shorter bouts of moderate intensity exercise can be done each day to achieve this target. Choose modes of exercise that you enjoy!

Fit to Play continued

Neuromuscular exercises (coordination exercises)

Exercise training enhances muscle balance and physical condition in preparation for the work of musical performance, but other exercises are particularly useful for increasing fine motor control. Practicing very disciplined fine movements appears to be useful for musicians and may reduce tension by improving control. Examples of neuromuscular coordination exercises include the practice of independent and coordinated movements of the muscles in the hand and the face.

General bodywork

Yoga, Feldenkrais, Eutony, Flow, Alexander Technique, Tai Chi and Gyrotonics all use different approaches to work on core support of movements. They do this in a wide variety of ways by teaching techniques that use stretching, balance exercises, core strengthening exercises, relaxation of tense muscles, and movement guidance or a combination of these. There is not much evidence for how these techniques work, and it is not clear yet whether one technique is better than another, particularly as there is a common theme of central support that facilitates balance and freedom in the arms and legs. If the one you first try doesn't suit you, try another. They are quite different; so select the one you find most personally beneficial. Remember that practitioners who teach these techniques are often NOT health professionals. They and their programs are therefore not qualified to specifically manage injuries.

Regaining physical performance condition after a holiday

Muscles lose their condition very quickly over periods of inactivity. Thus, it is important to build up your musical practice in a graduated manner after a break. This is because the special cellular structures that produce muscle energy – mitochondria – increase or decrease in number in response to the demands on the muscle system. If there is not enough energy, or fuel supply, for performance you will cause damage to muscle structures. Some musicians develop compensatory (or abnormal) movements that use muscles that aren't tired and this can cause longer term problems to develop. You should resume practice before the performance season begins to avoid a sudden overload on your muscles at the start of your performance year. If you are away from your instrument at the end of your vacation, work on general cardiovascular fitness as well as specific exercises that condition the relevant muscle groups used in playing.

The Role of Rest

Resting during the day

At least 10–15 minutes rest is necessary to allow muscles to recover from practice, performance, or rehearsal. Practice sessions should not exceed 45 minutes without rest, as this is the endurance limit of most muscles. Shorter sessions are better for vigorous playing, as fatigue occurs more rapidly. Whenever resting between practice sessions, energy stores should be replenished by changing physical position, eating a snack, or having a drink of water.

Sleep

The body needs regular rest to replenish the body. Overall health, as well as specific structures such as muscles, will be negatively affected by lack of sleep. Rest is crucial to support performance demands by allowing for the replenishment of energy supplies within the muscles and the removal of waste products that are continually accumulating as a result of cellular metabolism.

Resting when injured

Rest following an injury has been defined the American College of Sports Medicine, (1997) in sports medicine as the process of:

Resuming

Exercise below

Soreness

Threshold

Once initial healing has occurred, careful and graduated active rehabilitation helps the injury recover faster, as long as the pain or injury is not aggravated by the task. An injured part of the body can still be relatively rested (e.g., with braces or modified playing/technique) while attention is paid to maintaining or improving overall fitness and strength to allow optimal return to performance.

Extended periods of rest should be avoided, unless specifically advised by an experienced medical practitioner. Extended rest results in poorer healing, deconditioning, loss of technical facility and negative psychological consequences. "Doing nothing does nothing!"

The Role of Rest continued

Return to play after injury

Returning to play should involve a graduated progression from “can’t do” to “can do”. Start by playing at a level that you can manage and slowly increase speed and difficulty as your injury improves to tackle more difficult tasks. It is counter-productive to risk re-injury as a result of pushing too hard. It is generally advisable to start with shorter playing sessions with plenty of rest/recovery time, rather than attempting to go straight back to extended playing periods. After a significant break due to injury, several weeks may be required before returning to full playing.

Exercise of the recovering body part in a way that most closely resembles the musical action (functional rehabilitation) is important. Start by strengthening parts of the body away from the instrument, then gradually re-integrate all the movements and exercises back into your playing.

To enhance healing, make sure you optimise your diet and hydration and take the opportunity to work on general fitness.

Model timetable for return to play after injury

The duration of sessions should be arranged such that your injury does not worsen, while aiming to continue a gradual improvement in playing capacity. Therefore, do shorter sessions more often to start with, to avoid further damage and allow an increase recovery time. It is also important to be working on overall physical condition, and maintaining the strength of the non-injured parts of the body used in playing. The table below shows an example of how such a timetable may look, although times and repertoire choice should vary depending on each individual and their injury.

| STAGE | Warm-up | Play | Rest | Warm-up | Play | Rest | Warm-up | Play | Rest | Warm-up | Play | Rest |
|-------|---------|------|------|---------|------|------|---------|------|------|---------|------|------|
| 1 | 10 mins | 10 | 60 | | | | | | | | | |
| 2 | 15 mins | 15 | 60 | 15 mins | 10 | 60 | | | | | | |
| 3 | 15 mins | 15 | 60 | 15 mins | 15 | 60 | 15 mins | 10 | 60 | | | |
| 4 | 15 mins | 20 | 45 | 15 mins | 15 | 60 | 15 mins | 15 | 60 | | | |
| 5 | 15 mins | 25 | 45 | 15 mins | 20 | 45 | 15 mins | 15 | 60 | | | |
| 6 | 15 mins | 30 | 30 | 15 mins | 25 | 45 | 15 mins | 20 | 45 | 15 mins | 15 | 60 |
| 7 | 15 mins | 40 | 30 | 15 mins | 30 | 30 | 15 mins | 25 | 45 | 15 mins | 20 | 45 |
| 8 | 15 mins | 45 | 15+ | 15 mins | 45 | 30 | 15 mins | 30 | 30 | 15 mins | 30 | 30 |
| 9 | 15 mins | 45 | 15+ | 15 mins | 45 | 15+ | 15 mins | 45 | 30 | 15 mins | 45 | 60 |

Muscle Fatigue and Tension

Australian professional orchestral musicians report that muscle fatigue and tension are major reasons for injury. Thus, understanding why these occur and how to recognise and manage these conditions is likely to be important for injury prevention.

What causes muscle fatigue?

Factors that influence time to fatigue include:

- i** Cardiovascular efficiency; the fitter you are, the longer you can play.
- ii** Hydration and nutrition; adequate water and carbohydrate intake gives your body more playing fuel
- iii** Movement efficiency; using the right muscle for the job reduces effort
- iv** Muscle strength; to play longer, use as little muscle effort as you need to for achieving the best sound results
- v** Amount of force applied; oversqueezing or excessive impact should be avoided
- vi** Duration of use; muscle endurance takes time to build up and there is usually a 45-60 minute limit of muscle endurance

What are the signs of muscle fatigue?

Fatigue is determined by both central (i.e. brain processes) and peripheral (i.e. at the muscle itself) mechanisms. When you start to think that you are getting fatigued, this is your brain's way of warning you that you are running out of energy and need to stop what you are doing to avoid harm. You may also experience mental fatigue signs such as being unable to focus on what you are doing properly. Mental fatigue can be exacerbated by poor lifestyle habits such as lack of sleep and too much alcohol. Once there is no fuel in the muscle itself (this causes muscle fatigue), there will be insufficient energy to be able to continue the task normally. Typical signs of this include shaking, limb heaviness, increased tension and altered movement patterns. This muscle fatigue will occur more rapidly if you are not managing your diet well or are dehydrated. Being fit helps you to more effectively get blood to working muscles and can increase how long you play before fatigue.

If I am fatigued, how should I best recover?

As a general rule, 45 minutes is as long as you are likely to be able to play without exhausting energy supplies within your muscles and becoming fatigued. This varies a bit according to how vigorously you are playing and your state of general health.

You should take a minimum break of 10–15 minutes to allow muscles to restore their energy supplies. Get up and move around to change the body's position, rehydrate yourself with water and have a protein and carbohydrate snack (e.g. fruit smoothie/yoghurt or cheese sandwich).



For more diet tips check out the Nutrition section page 43

Move Well, Play Well

The body is designed to allow particular movements to occur at each body part, and these movements normally start from central body movement and then flow along the arm or leg outwards to the hands and feet from the trunk. Performing movements with good trunk support reduces strain on the body and improves control of the hands, thereby directly influencing performance.

Professional musicians need to *check-in* on their movements regularly

In elite sports domains, athletes have long recognised the importance of maintaining regular technical analyses, often with the assistance of a coach. This is NOT because they can't play well, but is to ensure they keep at the top of their game. It is considered a fundamental part of training for elite sports professionals, and indeed at the Australian Institute of Sport motion analysis forms a large component of the sports medicine support of athlete training. Research on elite fine skill performance consistently reinforces that visual feedback is an essential component. This should occur with professional musicians as well, although it has not been a traditional discipline within practice habits. Video yourself from different angles regularly to ensure you are playing with correct posture and body movement; movements can easily change without your being aware of it and this may lead to injury.

What causes altered playing movements to happen?

There are a number of factors that can create a change in movements.

For example:

- 1.** When a muscle becomes fatigued, the body tries to help continue the task by recruiting additional different muscles. These will have slightly different actions and so the movement changes in a subtle but important way and this can lead to muscle misuse (i.e. the wrong muscle is used for the desired action).
- 2.** If you have pain the body will alter how it moves to try to avoid the pain, even if that movement is not ideal for the playing task.
- 3.** Adopting a non-ideal posture by using poor chairs for example, fundamentally changes how well the trunk or central body can support the arms, and this can lead to non-ideal movement.
- 4.** Playing in awkward positions or stage arrangements can result in players adapting their movements to be able to perform, but these adaptations need to be removed once the task is completed. This often occurs subconsciously, so it is only by 'checking-in' that the abnormal movements can be detected.

The sense of body position (proprioception) is most strongly influenced by vision, reinforcing the importance of maintaining a regular habit of observing playing actions.

Fuel for Performance

When performance demands are high correct nutritional and energy needs must be met. This is in order to provide adequate nutrition to power performance, and for building and repair of tissue. By consuming the right amount and types of fluid and food, you will be better able to maintain glucose (energy) levels for the duration of the activity. This will help to maximize performance capacity, as well as improve recovery. Your overall amount of exercise, your gender, your metabolic rate and intensity of performance demands (e.g. strenuous or light) will all alter your nutritional needs, so how much you need to eat can change from day to day. When correct nutritional intake is inadequate, you will have reduced energy for performance.

Glycogen and carbohydrates

The main source of energy for muscles, apart from oxygen, is glycogen - a substance that is derived from the metabolism of carbohydrates. Carbohydrates provide a major source of glycogen, and studies on endurance athletes show that adequate consumption of these is important in sustaining muscular endurance and reducing fatigue.

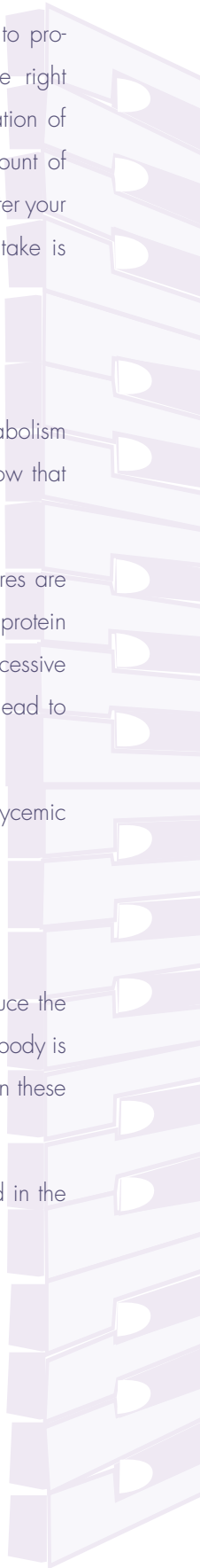
Glucose not needed for immediate use gets stored as glycogen in the liver and muscles. When glycogen stores are replenished, excess carbohydrate or sugars get stored as fat. Once glycogen supplies are used up, fat as well as protein (i.e. the muscle itself) will be used by the body as a substitute to provide the necessary fuel for performance. Excessive or increased intake of easy to absorb carbohydrates (or those with a high glycaemic index - high GI) may lead to increased fat deposition and weight gain.

Good carbohydrate sources include wholemeal breads and vegetables. These carbohydrates have a lower glycaemic index, which means the way the glycogen is formed and supplied gives you longer-lasting energy.

Protein

Since protein is important as a building block for muscle, failing to have enough protein in your diet can reduce the ability to build and maintain tissues. This can result in failure to achieve optimal performance and recovery. If the body is starved of fuel (i.e. low glycogen), direct damage to the working muscles can occur by the body breaking down these fibres to provide an energy source, thus preventing recovery and causing injury.

In music performance where high levels of muscle activity are involved, adequate protein needs to be included in the diet as this is critical for the building and repair of muscles that are being frequently used.



Fuel for Performance continued

Hydration

Water makes up 70% of blood volume, so it is important to maintain adequate hydration when performing. Keeping well hydrated is crucial for singers, as vocal cord function will be reduced if dehydration occurs. Extra care with hydration should occur if performing in conditions of low humidity.

Dehydration will decrease optimal performance as a result of decreased blood supply to deliver oxygen and nutrients to the working muscles. The amount of fluid intake needed also depends on the amount of fluid you are likely to be losing during performance. For example, you will be likely to need to drink more water during outdoor performances in the hot sun or those in crowded or warm venues under hot lighting, than during indoor performances in a cool venue.

Alcohol intake can increase these dehydrating effects and can delay recovery if consumed in excess directly after a performance. If you are having an alcoholic beverage after a performance, try to firstly eat a small meal or snack containing some protein and carbohydrate to replenish the body's needs. Remember to drink enough water.

A performance diet should include consideration of the nutrition and hydration that the body needs before, during and after the performance.



Other useful nutrition and hydration guides

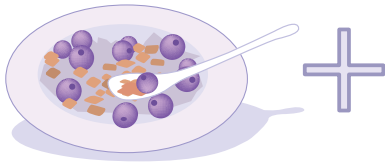
www.athletesandthearts.com/topics/nutrition-and-hydration

Performance Diet Example

Before a performance

3 - 4 hours before a performance

Moderate sized carb & protein rich meal

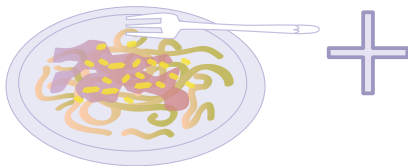


Half to 1 hour before a performance

Light snack - fruit or energy bars



At least 500ml - 1L of water with your meal



Keep hydrating!



1. 3-4 hours before a performance you need to eat a meal containing carbohydrates and nutrients and drink a decent amount of water, e.g. 3-4 glasses, that will make sure your body is fuelled up and ready to go.
2. Food snacks prior to performance re-fuel the system BUT should not be too large or too heavy as this may result in too much blood being diverted to your stomach to help with digestion. This can make you lethargic and drowsy. The food consumed should be low in fat and fibre, contain moderate protein and relatively high levels of carbohydrates.
3. Eat familiar well-tolerated foods to avoid indigestion before a performance.
4. Try eating new foods and drinks before a practice session rather than a performance so you know how it will affect your playing and comfort.
5. Following your meal you should feel full but comfortable so you are not hungry during the performance.
6. Don't forget to drink enough water with your meals to keep up blood volume.

Examples:

- Lean meat hamburger
- Meat and cheese sandwich
- Stir fry meat and vegetables
- Pasta with sauce and cheese
- Cereal or oats with milk and fruit
- Yoghurt with muesli and fruit

About ½–1 hour before performance it is important to eat a snack and have a small amount to drink.

Examples:

- Fruit
- Energy bars
- Liquids such as a smoothie or sports drink.

The Effect of Alcohol on Performance

Guidelines for alcohol consumption suggest that men and women should not drink more than 2 standard drinks per day to reduce the risk of developing alcohol-related disease or injury.

Excess alcohol can affect your body in many different ways:

- Alcohol acts as a diuretic. It stimulates your kidneys to produce urine causing your body to lose fluids and become dehydrated. This can affect your blood volume and the ability to get oxygen and nutrients to working muscles.
- Alcohol acts to suppress the body's ability to use fat during activity. It can also decrease the absorption of minerals and vitamins such as B12, Folate and Zinc.
- Alcohol acts as a depressant – it can lead to decreased concentration and impaired ability to make decisions.
- Alcohol affects the body's sleep patterns. This can lead to sleep deprivation, overall fatigue, negative mood states and loss of concentration.
- Alcohol also has negative effects on healing of muscles or other structures that may have been strained during the performance. It increases inflammatory responses as well as reducing the absorption of nutrients into the tissues. Excess alcohol consumption the night before a performance can lead to impaired performance and early fatigue.

To avoid these effects, make sure that before you drink alcohol, you rehydrate with water and have a small meal containing both protein and carbohydrate. If you are having a glass of wine, try to have a glass of water as well.



For detailed information on alcohol consumption

www.alcohol.gov.au

Breathe Well/Play Well

Oxygen is used to produce energy for the working muscles and so breath holding will lead to earlier muscle fatigue. If this is a problem, use strategies such as notating breathing to remind you where to breathe in your practice sessions. Oxygen is used to produce energy for the working muscles so breath holding will lead to earlier muscle fatigue. If this is a problem, use strategies such as notating breathing or singing to remind you where to breathe in your practice sessions.

Breathing to sing and play

Breathing against resistance requires different muscle strategies from normal breathing, and so musicians need to use their accessory breathing muscles, particularly rib cage and abdominal muscles, optimally to refine and control airflow. Good control of airflow reduces unnecessary strain on the embouchure and upper respiratory system of the neck and soft palate. Breath amount should be phrase dependant, and this should be focussed on as part of practice sessions. Air flows from high pressure to low pressure, so while hyperinflation (too much air in the lungs) may provide some added pressure behind the outbreath, it is not controlled and hence less effective than air supply supported by muscles, and it also greatly increases the work of breathing in.

At the end of the outbreath lungs should be close to empty, and the first step is to quickly relax the abdominal muscles a split second before breathing in. This makes the in breath much faster and easier. There should be no noise on the in breath as this indicates glottis closure, again unnecessarily increasing the work of breathing. This problem is largely fixed by relaxing abdominal muscles and letting air come in naturally prior to actively breathing in, but you can also imagine you are making an "oh" sound to help you open your vocal cords. Once you have inhaled enough air for that phrase, engage your pelvic floor muscles (and lowest abdominal muscles) a split second prior to breathing out. This will ensure that the squeezing of the abdominal muscles will cause the air to flow upwards and out the mouth; otherwise there will also be downward pressure on the pelvic floor. Lastly, ensure your rib cage is mobile and warm up before playing, as movement here is an important part of the breathing action.

Breathing and relaxation

In normal breathing, controlled automatically by the central nervous system, adults take about 12–15 breaths per minute. In situations of stress, this rate typically rises as a result of stimulation of the sympathetic nervous system (the "fight or flight" part of our autonomic nervous system that reacts to stressors). Slow breathing techniques, such as those commonly used in meditation, yoga (pranayama) or asthma treatment (Buteyko method), have been found to help reduce sympathetic nervous system activity (e.g. racing heart rate, hyperventilation and sweaty hands), and manage anxiety. Most of these breathing exercises focus on reducing the breathing rate to a maximum of 6 breaths per minute and minimising activation of the breathing muscles, particularly by trying to keep neck, chest and abdominal muscles relaxed during breathing.

Sound Practice

While professional orchestral musicians become better at organising their practice through experience, there are a few useful things to remember that may help further refine practice techniques.

Don't panic practice - if you start every practice session in good physical and mental condition you will produce effective results in much less practice time.

For elite performers, practice recommendations use the **S.M.A.R.T** acronym:

- **S = Specific** goals for each practice session.
- **M = Measure** goals to know if you've improved (e.g. video/audio recordings)
- **A = Achievable** goals. E.g. don't rush into a full practice load after inactivity. Break it into shorter sessions and gradually build up; use mental practice.
- **R = Realistic** goals. This may even include acknowledging that, in a period of sudden increased playing, teaching may involve off-instrument lessons.
- **T = Timely** practice sessions to avoid fatigue and injury. Practising vigorous repertoire can work muscles much harder than normal, therefore these sessions may need to be shorter in duration.

Simple tips include

1. Be mentally and physically prepared before you start practising. If you are exhausted, ask yourself if you will really improve by practising in this state.
2. Plan and organise practice sessions according to energy levels, physical condition, and repertoire demands.
3. Make sure you have eaten and are adequately hydrated before starting.
4. Warm up your mind and body before playing to make the most of your session.
5. Incorporate specific off-instrument exercises first if necessary (e.g. when returning from injury).
6. Practice over an appropriate time frame.
7. Re-evaluate whether you achieved your goal(s).
8. Recover and replenish your system with food and water. Resting less than 15 minutes between practice sessions is **NOT** enough time for muscle recovery or recovery from mental fatigue.

Posture

What is the best posture for musicians?

Posture must provide balance and support to the body, allowing the player to make subtle adjustments to body position and orientation. These adjustments are necessary to support instrument weight or movements involved in playing. For wind and brass players, some degree of backrest support may assist with instrument load bearing. Overload of the arms results in stiffening of the rib cage to help support and stabilize, negatively affecting breathing patterns.

An optimal music performance posture should allow muscles and joints to move in the best way possible to achieve musical expression with the least amount of strain on the body. Both musicians and music health experts believe that postural faults contribute to problems with technique and an increased likelihood of injury.

Standing while playing enhances abdominal muscle support in breathing for wind and brass players. In sitting, seat inclines make minimal difference to abdominal muscle activation levels - it is probably best to choose the level of incline where you feel the most comfortable and in control during playing.

The traditional medical view of standing posture is that the body is aligned so that the pull of gravity is balanced down through the curvatures of your spine, passing through the knee and hip joints then into your feet. The feet allow weight shifting back and forth and side to side into the balls and heels by simple swaying actions that require little work from body muscles. This swaying allows the gravity forces to continue to travel through the body in a way that reduces muscle effort in holding the musician or instrument upright. This weight transference should logically follow the movements and instrument support requirements of performance.



Chair adjustments

To help maintain a comfortable and supportive sitting posture, a good, adjustable chair needs to be set up in a way that provides postural support while still allowing musicians to move freely during playing.

In sitting, the general rule of thumb is that the hips should be level with or slightly higher than the knees. At the front of the hip joint, the cartilage can become compressed and degenerate early if the hip is bent more than 90 degrees. Instrument positioning and playing demands, as well as the physical characteristics of the individual, will also influence the optimum seat height.

Slouching should be avoided, as it tends to bring the head forwards, create tension and strain in the neck, restrict tongue and jaw movements, impair breathing, and place strain on the discs in the spine.

Posture continued

Ergonomic devices

The term 'ergonomics' describes the process of person-task-environment fit, in the case of musicians, fitting a player to their instrument. This can include chair adjustments to properly support both your body and instrument, or the use of a special device to help hold up your instrument (e.g. a neck strap or a chin rest).

Ergonomic supports such as chair wedge cushions, chair leg raisers, or even a spare jacket behind your back or on the chair seat can be used as temporary solutions to help optimise your chair and better support your posture. Make sure that your regular practice chair set-up is ideal—it is worth the investment.

Your instrument set-up should allow you to perform in your optimal posture and position of playing. This will need to occasionally be modified as events occur that alter our body shape and condition. The thing to remember is that ergonomic devices allow you to be as comfortable and "unloaded" from your instrument demands as possible. They SHOULD NOT be a crutch to support bad postural habits.

Postural supports

As well as taking care to use the best chair you can, adjusted well, and to wear supportive and balanced footwear, there are a multitude of external instrument devices that aim to assist in maintaining the best posture and instrument support. There are many devices including thumb rests, neck straps, shoulder rests, chin rests and bent spikes. However, the most important factor with these support devices is that they should best fit the instrument to the musician in the most ideal performance posture. They should NOT be used as a crutch to support bad postural habits. Use a video or mirror to ensure that your posture and movements have improved and not worsened as a result of using the device.



See the Tip Sheet for useful posture examples page 56

Managing Injuries

Injury definition

The term “injury” may be used to describe pain or impairment occurring as a result of inappropriate levels of exposure to physical, psychological or environmental stressors. Essentially, these occur as a result of the body part being unable to cope with the loads placed on them. In all cases it is better to prevent the occurrence of physical and psychological damage than to try to manage them once they have happened.

Musicians’ performance-related injuries result from exposure to at least one physical, environmental or psychological demand at levels that exceeds the body’s ability to cope within the task of musical performance. These injuries commonly occur as the result of the player being exposed to several interacting risks - for example, long hours will not necessarily cause an injury to a professional musician until another factor, such as increased stress, is added.

Acute injury management

Managing injuries well from the beginning allows the best repair of injury and hence avoids the added burden of fear and psychological distress that arise from longerterm (chronic) injuries.

The general rule of thumb is to follow the **R.I.C.E.D** acronym:

Rest. First 1-2 days—this may be relative rest such as using a brace.

Ice. Ice is better than heat to reduce swelling in the first 1-2 days.

Compression. If there is swelling, using a compression bandage can help.

Elevation. If there is swelling, elevating the injured area will reduce this.

Diagnosis. If the injury isn’t settling in the first 2-7 days, get medical advice.

Chronic Injury Management

The term 'chronic injury' refers to injuries that have been present over extended time periods (e.g. for longer than a month). These injuries are more complicated to treat, as by this stage the injury may have had an impact on technique, confidence, participation in physical activity, and so on. In addition, extended periods of pain make nerves hypersensitive; thus pain is more readily aggravated. Often these injuries progress from an acute injury that wasn't managed well.

Effective management of these conditions often requires the involvement of a few health professionals (e.g. physiotherapist and psychologist) and an in-depth assessment of potential avenues to restoring health, such as: modifying playing schedule; movement analysis (chronic injuries usually change the playing action); posture analysis; specific exercises to restore strength, flexibility, balance and control; appropriate treatment and/or medications as required.



Get help early for playing-related pain

Psychological Health for Musicians

As a professional performer, there will inevitably be times when you are anxious about an upcoming performance, or perhaps have an issue with a co-worker and so on. To manage everyday sources of stress, there are many useful techniques taught by psychologists to help you manage such conditions. These include meditation, slow breathing exercises, imagery and combinations of these techniques such as practiced during mindfulness approaches.

Some of the benefits of performance psychology can be found at the website of the Australian Psychological Society at: <http://www.psychology.org.au/community/specialist/sport/>

This website also contains many useful tip sheets to help manage a variety of psychological conditions at: http://www.psychology.org.au/publications/tip_sheets/

However, while it is useful to undertake regular exercise and other activities that can help manage stress and anxiety, it is also important to accept and recognise that sometimes it is too difficult for us to manage on our own. There is nothing wrong with this, and it is completely normal for athletes to seek out performance psychologists to optimise their performance as well as help manage unwanted emotions or feelings. Similarly, musicians can greatly benefit from learning proactive and positive strategies from performance psychologists to facilitate an optimal mental state during musical rehearsals and performances.

If there are strong or recurrent emotions or feelings occurring, professional advice should be sought. There are many different conditions that can affect mental health, and these need to be diagnosed correctly by qualified mental health professionals to ensure the correct approaches to management are taken. On no account should performers take medications not specifically prescribed for them, as this can have detrimental effects. For example, if you are suffering symptoms that are a consequence of depression rather than anxiety, beta blockers are not necessarily the correct way to manage this, and may in fact make the symptoms worse.

How do psychological therapies work?

All forms of anxiety are responses to real or perceived danger. We learn about danger through personal experience, the reactions of our parents, and the outcome of events on others. So, we may learn to be anxious about our own feelings because some families are uncomfortable with or anxious about the expression of feelings. They may react with indifference, sarcasm, humour or anger to situations, or conversely learn not to show a range of emotions including anger, love, jealousy, excitement and interest.

Other feelings of anxiety may be based on past experiences of yourself or your family. For example, you may have been attacked by a dog as a young person and from that experience, develop a fear of all dogs. Conversely, your mother may have been afraid of dogs and reacted anxiously every time she saw a dog. Even though you may never have had a bad experience with a dog, you may start to act anxiously around dogs simply by observing your mother do so.

When people become anxious about their feelings they avoid the feelings and try to avoid the situations where they

Psychological Health for Musicians

How do psychological therapies work? continued

fear that they may be judged or criticised. We will often try to talk ourselves out of our feelings without realising that the intensity of the emotional response may relate to past times and situations in our lives, rather than the current situation in which we now feel anxious.

In treatment for music performance anxiety, psychologists explore not only the presenting anxiety but also the underlying feelings and the ways you have been thinking and behaving to try to manage your anxiety. There is a focus on the experience of the feelings in the body, and the thoughts and memories attached to those feelings. This allows the feelings behind the anxiety to come into focus, thus allowing them to be processed. This may feel distressing for a while but eventually you will experience relief from the intense anxiety that you feel. As you gradually allow yourself to be exposed to your feelings in the safe environment of the therapist's office, anxiety decreases as your understanding increases about the relationship between the past and present. You become more able to be fully present in your performances without past issues interfering with your immersion in the music.

Psychological treatments

There are a number of psychological treatments available to assist anxious musicians. It is important that treatment type is matched to the type and severity of the music performance anxiety experienced and whether there are other conditions present, such as another anxiety disorder (e.g., social anxiety or panic), and whether depression is also a feature of the clinical presentation.

Many people with anxiety conditions respond well to cognitive behaviour therapy (CBT), which offers a range of interventions including the identification of stress and triggers, breathing and relaxation, thought management, called cognitive restructuring, which involves exposing and challenging unhelpful beliefs and thoughts, and lifestyle changes. The psychological tip sheets provide more detailed information on all of these interventions.

In the case of severe performance anxiety the treatment of choice is dynamic psychotherapy, including psychoanalytic psychotherapy, attachment-informed psychotherapy, and Intensive Short Term Dynamic Psychotherapy (ISTDP). These address the source of the anxiety rather than the responses or symptoms alone. The aim is to focus on the experience of the feelings behind the anxiety and the thoughts and memories attached to those feelings, which, once identified, can be processed and resolved.

There is research supporting the effectiveness of these therapies when patients are carefully selected. They should be delivered only by suitably qualified psychiatrists or psychoanalytic psychotherapists who have had additional training in psychoanalysis (and are members of the Australian Psychoanalytic Association) and psychologists who are registered to practice with the Australian Health Practitioners' Registration Board of Australia (AHPRA) and who belong to the clinical or counselling colleges of the Australian Psychological Society (APS - www.psychology.org.au), which offers a *Find a Psychologist* service to the public in all Australian states.

Hearing Health

Hearing loss through exposure to sound is cumulative and permanent - the ears eventually 'wear out' after repeated exposure to moderately loud sounds. Potentially damaging sound levels are often found in many parts of the orchestra and even occur during private practice for the louder instruments.

Damage to the hearing may lead to reduced hearing levels, hyper-sensitivity to some sounds, permanent ringing or buzzing in the ears and pitch discrimination problems. For continued music making at the professional level, it is well worth investing some time and thought into how to protect your ears and to develop healthy hearing habits in all aspects of your life, not just while playing.

Preserving your hearing is the responsibility of both your employer and yourself. In an orchestra this is especially true, as protecting hearing while maintaining a musically meaningful connection to those around you can be challenging. Thankfully, approaches to hearing conservation for orchestral musicians have come a long way in the last decade or two, both from technological and workplace health and safety points of view.

Given knowledge of the sound levels to which you are exposed, clear warnings about when risk levels are going to increase, and guidance on options for personal hearing protection to suit you and your instrument, you should be able to develop your own effective approach to looking after your ears throughout your career.

You have a right to ask what your sound exposure is or is likely to be at any concert or rehearsal, and your orchestra should have a range of measures in place for dealing with high sound levels. These may include acoustic screens (both large and smaller individual screens), the use of risers to separate instrument sections, appropriate orchestral setup, rotation of the rear desks of string sections, rostering according to exposure for extended high-level seasons, appropriate panning of repertoire and rehearsal time to avoid 'heavy' days and an ongoing management of sound exposure using a range of administrative and engineered controls.

Personal acoustic screens made from Perspex have been shown to significantly increase sound levels to those musicians 'upstream' and need to be set very close to the ear to have any real effect and as such the use of these screens is not recommended. Laboratory testing has shown that this problem can be remedied using absorptive wrap-around personal screens, which have been shown to reduce sound levels to the rear by up to 8 dB.

When control measures such as those mentioned above are either not sufficient to reduce sound to safe levels or start to impact on things like ensemble, acoustics and performance standards it is essential that you have a set of ear plugs that still allow you to play your instrument effectively and clearly hear those around you. Unfortunately all ear plugs - even the most expensive - are not alike.

Hearing Health continued

The 'industry standard' custom moulded musicians' plugs can be excellent, but poorly made custom earplugs with inferior filters can be as challenging as using industrial earmuffs. Good custom plugs should use high quality 'musicians' filters rather than the cheaper generic filters, which have a very poor sound quality. Your earplugs must be 'tuned' by the manufacturer and should be made of soft, clear silicone, which maintains its shape over time. If you have yellowing/cracking or shrinking plugs with a narrow parallel sound bore, chances are you need to get some new ones.

If your instrument connects with your head in any way, it is also essential that you have your custom earplugs made so they fit quite deeply into the ear canal to improve sound quality and reduce occlusion (a predominance of your own sound (voice or instrument) in your ears). Audiologists are able to do this upon request and are trained in this type of fitting. In orchestral situations, players often wear earplugs that 'over attenuate' or block out too much sound. For many, a 9dB reduction is more than enough to stay 'safe,' and any more than this may risk a feeling of isolation or disconnectedness just when we need exactly the opposite.

Level-dependent electronic earplugs are available now and are being used in some of the professional orchestras. Although they don't suit everyone, the players who like them tend to love them, with several Australian musicians now using these plugs exclusively. These plugs run on a hearing aid battery and are switchable between 9dB and 15dB attenuation — a custom moulded sleeve is also necessary to reduce occlusion while you have them in.

Earplugs obviously aren't ideal and even the best are far from perfect, but the compromises we are forced to make wearing them are a small price to pay for avoiding permanent hearing problems. Like other aspects of playing, using earplugs is an acquired skill that takes practice to develop. There are many examples of players of all instruments who are able to successfully adapt to earplug use, even in the most stressful situations. The gold standard of course remains the open ear, but a properly fitted (and tuned!) earplug is a tool of the trade.

There is a lot that can be done to manage your exposure over your career and it is entirely possible to play in a high-risk position for many years without damaging your ears, but early-formed habits are easier to maintain, even in very challenging situations. If your ears ring for an hour or two after concerts, rehearsals or practice sessions and things sound a little 'dull,' this usually means temporary hearing loss has occurred. While this situation recovers after a period of time, repeated episodes of temporary hearing loss will inevitably lead to permanent damage. If you suffer a temporary hearing loss, make sure you give your ears at least twenty-four hours of rest (preferably forty-eight). You should also work out ways to avoid similar situations in the future, and talk to your management about ways that you can manage your exposure.

Hearing Health continued

The risk of damage to hearing from sound occurs either when instantaneous peaks exceed safe levels or when moderate levels of exposure occurs over long periods. 85 decibels sustained for 8 hours is the maximum daily limit before hearing loss is risked. As the decibel scale is exponential, a 3 dB increase doubles exposure and as such halves safe exposure time, so 88 dB is safe for 4 hrs, 91 dB for 2 hrs and so on. This table gives some orchestral examples:

| Instrument | Median peak levels* | Sustained exposure range* | % of daily exposure limit after one 2.5hr orchestral call (based on upper limit of range) |
|------------|---------------------|---------------------------|-------------------------------------------------------------------------------------------|
| Trumpet | 125 dBC | 82-95 dB LAeq | 310% |
| Clarinet | 123 dBC | 80-94 dB LAeq | 248% |
| Violin 1 | 120 dBC | 77-91 dB LAeq | 124% |
| Percussion | 136 dBC | 82-96 dB LAeq | 393% |

*based on levels measured over three years in a professional orchestra as reported in O'Brien I, Wilson W, Bradley A. Nature of orchestral noise. J Acoust Soc Am. 2008;124:926-39.



See the Tip Sheet for ways to keep your ears in great shape page 60

Hearing Health continued

Now, some myth busting

- 1.** "It isn't that loud..." An orchestral trumpeter playing concert A at fortissimo in a practice room can risk hearing damage after about three and a half minutes. Sound levels measured at the ear of a 1st trumpet playing a Mahler Symphony indicate the trumpeter would be at risk of hearing damage after about twenty minutes of rehearsal or performance. Different instruments and different repertoire carry different risks, but conclusive studies confirm it can be 'that loud' for most instruments at least some of the time.
- 2.** "This is a pit orchestra problem..." Comprehensive studies show sound levels on the concert hall platform are regularly as intense as those in the orchestra pit, although the quality of the sound may be very different and duration/regularity of exposure is often greater during opera/ballet seasons.
- 3.** "There is no evidence of classical musicians losing their hearing..." There are now many studies that confirm that classical musicians exhibit significantly greater incidence of noise-related hearing pathologies than the general population, particularly in those under forty years of age. Such pathologies include tinnitus, diplacusis (pitch distortion), hyper-sensitivity to sound and permanent threshold shift.
- 4.** "I'll lose my hearing when I get older anyway..." Everyone's hearing does deteriorate with age, however those with noise induced hearing loss tend to suffer Instrument Median peak levels.
- 5.** "My ears have a built-in protective mechanism..." There is a physiological mechanism that reduces sound exposure when sound levels get moderately high known as the acoustic reflex or the acoustic middle ear reflex. This reflex involves a contraction of the muscles in the middle ear, which in turn tightens the ear drum. While this does result in a slight lessening of incoming levels (by around 3 dB) the acoustic reflex has a very short duration - between 25 and 100 milliseconds - before the muscles in the middle ear begin to relax and hearing levels return to normal.



Healthy Hearing Tips

1. Obtain custom-fitted earplugs from an audiologist who understands the needs of musicians are a tool of the trade - always carry your plugs with you.
2. Do not over-attenuate – plugs that are too strong tend to be used less than they should. If you find your current plugs impossible discuss the possibility of weaker filters or better moulds with your audiologist.
3. Practice with your plugs at least once every session – both to reduce your exposure and to get used to the different sound and feel.
5. Hearing damage is cumulative – reducing your exposure time is as important as reducing your exposure level.
5. Give the ears twenty-four hours to recover after a heavy gig.
6. Use risers, distance and/or absorbent wrap-around screens to reduce exposure from sound to the rear.
7. Remember your own instrument is the source of your highest noise exposure (unless you play cello, bass or harp).
8. See an audiologist every twelve months (sooner if you notice any change in your hearing).
9. Remember all sound contributes to your exposure – from circular saws to a heavy-metal concert. Keep track of your exposure with a personal dosimeter or smart-phone app.
10. Make sure your practice room is appropriate. Avoid practicing in highly reverberant rooms.



See the Tip Sheet for a useful hearing protection guide page 59

Health Professionals

Where Should I go for help?

Specialized music medicine practitioners do not yet exist in Australia, but within each of the following disciplines there are some practitioners who have become more experienced in working with musicians. The relevant associations listed below should be able to help direct you to these individuals.

Medical practitioner/physician/doctor

These health professionals usually oversee the management of any major injury because they are trained to diagnose and treat physical illness, disease, and injury. They are also trained to promote good health and assist in the prevention of disease or injury. A General Practitioner is the doctor trained to give a general evaluation of many illnesses and injuries and make decisions about whether further care is necessary, as well as recommendations regarding the appropriate medical professional to provide further evaluation and management. There are also many specialists within medicine who focus on a particular disease or part of the body.

Physiotherapist

Physiotherapists are trained to assess and treat musculoskeletal disorders and movement problems. Treatment can involve movement and biomechanical analysis, exercise prescription, manual therapy, and advice. Some physiotherapists choose to specialize in a particular area and have post graduate qualifications in their area of interest (e.g. sports physiotherapy).

Psychological treatment

Psychologists are experts in human behaviour, having studied the brain, memory, learning, human development and the processes determining how people think, feel, behave and react. Psychologists apply their expertise using reliable and scientifically supported methods. Psychological treatments are widely used to assist individuals and families and can also help groups and organisations. (www.psychology.org.au/public/what-is-psychology)

Health Professionals continued

Audiologist

If you experience problems with your hearing such as ongoing ringing or a noticeable change in your hearing levels you should see your GP and/or your audiologist. Most audiologists will happily test your hearing without a referral and if you have a regular audiologist they will have your previous hearing tests on file for comparison. If a problem is found they will send a report to your doctor and if the GP decides any further medical investigation is necessary - such as consultation with an Ear Nose and Throat specialist - you will need a referral from your GP at that stage. For infections, discharge or pain in the ears your first stop should be your GP.

For preventative help - such as earplugs and advice on sound exposure - your audiologist is usually the most knowledgeable. Although not all audiologists are experienced with the needs of musicians, more and more are becoming knowledgeable in the field or are able to recommend specialist audiologists.

Chiropractor

Chiropractors have an alternative training approach covering human physiology and biology, with an emphasis on the spinal column. Chiropractors believe that the vertebrae of the spine can be pulled out of alignment by everyday stressors, and that these misalignments (termed "subluxations") are the cause of a myriad physical and mental ailments. Treatment usually involves manipulating individual vertebrae or readjusting the entire spine, to attempt to correct these subluxations.

Osteopath

Osteopaths have training that focuses on how the skeleton, joints, muscles, nerves, circulation, connective tissue and internal organs function as a holistic unit. Osteopaths may use a range of manual therapy techniques and exercises to help manage musculoskeletal disorders.

Health Professionals continued

Acupuncturist

Acupuncture uses fine needles to stimulate the body to relieve pain, activate an immune response, and promote healing. Training, style of acupuncture, and experience varies widely amongst practitioners. Check with your acupuncturist to establish their training credentials. Non-medical acupuncturists need accreditation with the Australian Traditional Medicine Society, which requires a minimum standard of education for members in order for their patients to be able to claim reimbursement from their health funds for their services.

Massage therapist

Massage therapy comes in many styles (remedial, rolfing, shiatsu, myotherapy, Swedish, sports, etc.) and can be effective for relieving muscular spasms and stiffness. Training and expertise varies widely, so it is probably useful to find a good massage therapist by word of mouth, or via a referral by your doctor or another health professional. Minimum training standards are required for membership of accrediting bodies and for rebate coverage by the health insurance companies—check with your health insurer to see if the therapist is part of a recognized provider association.

Helpful information sites

There are an increasing number of performing arts medicine organisations around the world, most of which have links to experienced health providers as well as providing some free health care resources online.

A few of these are listed below:

Australian Psychological Society www.psychology.org.au

Australian Association of Cognitive-Behavioural Therapists www.aacbt.org

Australian Psychoanalytic Association www.psychanalysis.asn.au

NSW Institute of Psychoanalytic Psychotherapy www.nswipp.org

Australian Government Department of Health www.alcohol.gov.au

Australian Society for Performing Arts Healthcare www.aspah.org.au

British Association of Performing Arts Medicine www.bapam.org.uk

USA Performing Arts Medicine Association www.artsmmed.org

American College of Sports Medicine www.athletesandthearts.com

Care of the Voice from the Texas Voice Centre www.texasvoicecenter.com

Non-health Professionals

Bodywork teaching techniques

There are many different forms of bodywork, which variously aim to increase body awareness and use of central body support to reduce strain and support the actions of the arms and legs during many different activities. These teachers may run group classes or one on one lessons. Many working with musicians are also musicians themselves and can apply their technique into musical actions. In some cases, allied health professionals such as physiotherapists are trained in these teaching techniques, and can incorporate specific injury modifications.

Feldenkrais

The Feldenkrais Technique aims to reduce pain and dysfunction by enhancing the body/mind connection. Practitioners train their patients to become more aware of how they are moving their body (especially the injured part in relation to the rest of the body) through mind/body exercises and gentle manual assistance whilst performing specific movements. These two techniques are referred to as Awareness through Movement and Functional Integration.

Yoga

Yoga is a system of exercise in which the body is put through a series of poses (asanas), with each one stretching some muscle groups and contracting others. Its goal is to improve balance in the body by restoring flexibility and strength to under or over-used tissue, and, as such, can be effective in resolving musculoskeletal pain and stiffness. It should be taught and practised carefully as injuries can occur in individuals who progress too quickly to advanced moves. There are many different styles taught, with the gentler forms (Iyengar, Hatha, Ashtanga, Oki, Bikram) being more appropriate for beginners.

Pilates

The Pilates method is a system of exercise that focuses on building a strong and stable trunk or "core". A series of movements that emphasise use of the deepest layer of trunk and pelvic stabilizing muscles (deep abdominals, gluteals, back extensors) are performed on both specialized equipment (the "reformer") and floor mats. Teachers emphasise concentration on control of movement, awareness of position, and reintegration of the strengthened muscle groups into more demanding movements as pupils progress. This method can be effective for managing pain and stiffness resulting from postural habits associated with performing. Many physiotherapists are also trained to teach Pilates.

Non-health Professionals continued

Alexander technique

The Alexander technique is an education/guidance system used to improve posture, movement, and muscle efficiency. It can be used to help rehabilitate from a playing related injury or as a preventive strategy. The Alexander teacher will observe and use verbal and manual correction to retrain movements that may be contributing to unnecessary tension or strain. Some home exercises may be given along with encouragement to continue to focus on what has been practised in class.

Gyrotonics

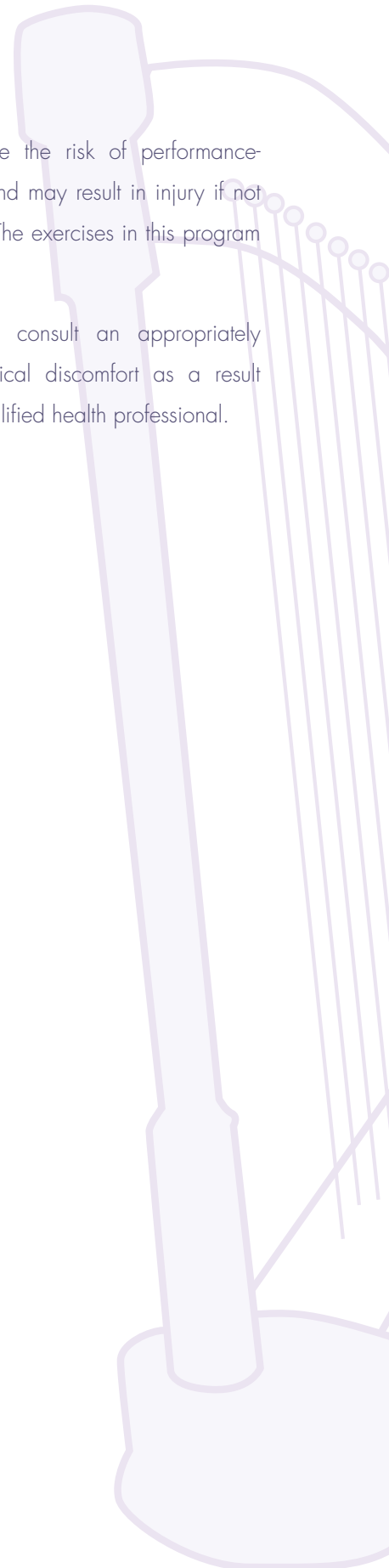
Gyrotonics is an exercise system originally designed for injured dancers that aims to produce balanced conditioning of the body by focusing on strength and flexibility. It is similar to yoga, but, like Pilates, uses specialized equipment (the pulley tower unit) to provide resistance to movement for strength training. As a relatively new modality, there is no administrative body; however gyrotonics is offered in some Pilates studios.

Tip Sheets

Medical precautions

The exercises included in this program have been developed to prevent or reduce the risk of performance-related occupational health injuries. However exercise of any kind is not without risks and may result in injury if not done properly, or if done by any person with a pre-existing injury or medical condition. The exercises in this program are intended to be carried out in accordance with the instructions.

However if you have any pre-existing injury or medical condition, you should consult an appropriately qualified health professional before starting the program. If you develop any physical discomfort as a result of performing any exercise, you should stop immediately and consult an appropriately qualified health professional.



Warm ups

Warm up before you play and cool down afterwards to keep your muscles in tip-top condition

When should I warm up?

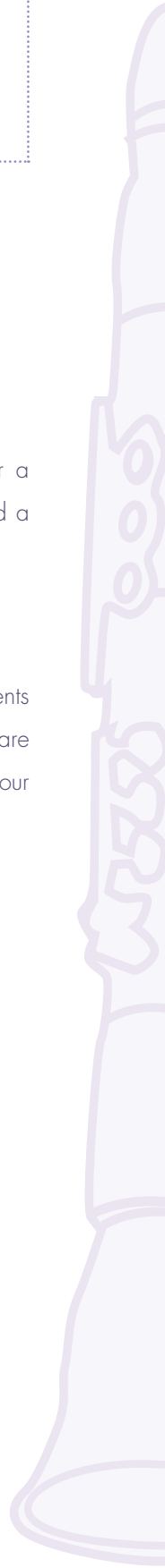
You should warm-up before you play both off and on your instrument to get your blood to your working muscles.

How do we think warm up works?

Warm-up is thought to function by dilating the blood vessels in and around working muscles. This allows for a greater volume of oxygen and nutrient rich blood to reach these muscles, facilitating optimum muscle function and a greater ease of playing.

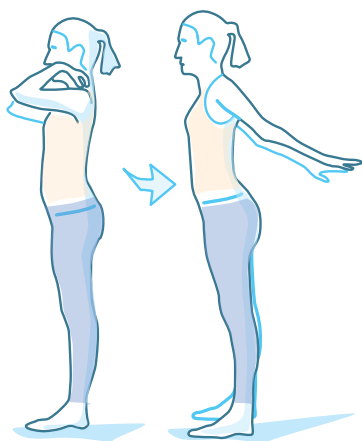
How should I warm up?

Varying approaches to warm-up are currently advocated, such as taking a walk, performing large, gentle movements using performance relevant muscles, or simply warming up on your instrument. Two general principles, however, are the subject of consensus: warm up should be pain free and performed at a non-fatiguing intensity. If you find that your warm up is causing pain or fatigue, try slowing your warm up down or changing your routine altogether!

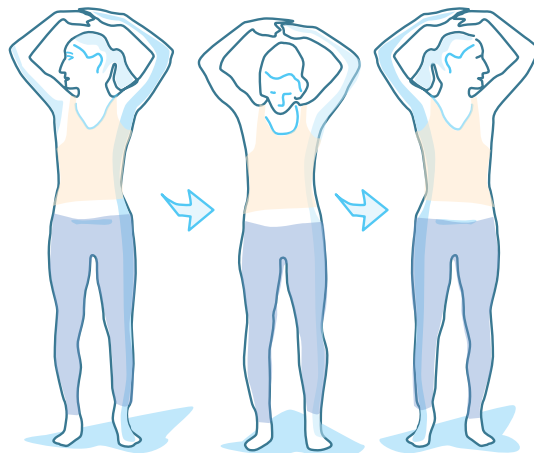


Warm ups continued

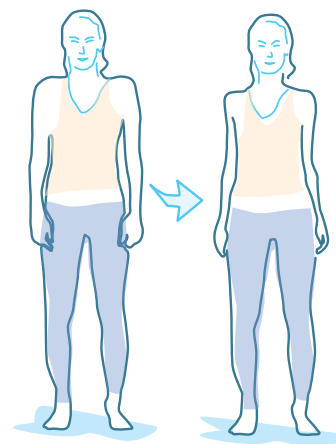
Shoulder Arms Neck



Arm Swings

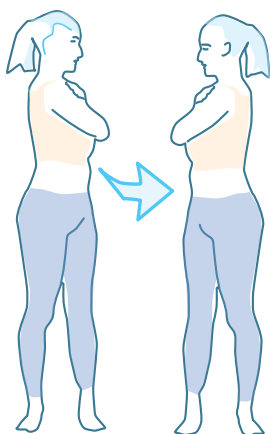


Neck Rolls



Shoulder Rolls

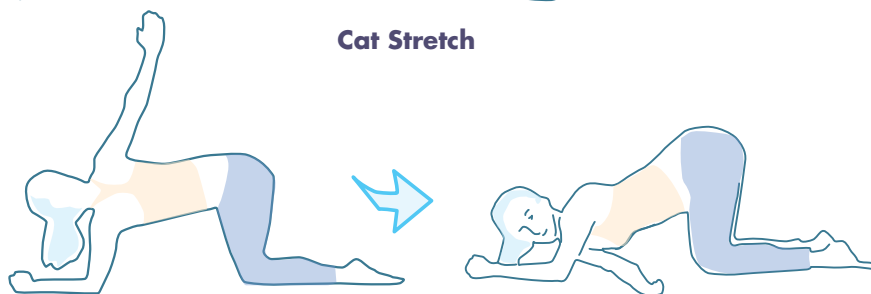
Spinal



Mid Back Twist



Cat Stretch



Thread the Needle



All warm up movements should take you through the largest range of motion possible while maintaining gentle, pain-free motion.

Stretching

Stretching can facilitate improvements in muscle elasticity and joint range of motion, but only if performed properly! Below are answers to common stretching questions that will help you get the most out of each stretch.

When should I stretch?

Stretch about ½ an hour AFTER playing, or at other times during the week when you are warmed-up. Stretching right before physical activity doesn't prevent injury and may be detrimental to performance as it "turns off" muscles.

How long should I hold each stretch?

Hold each stretch for three slow breaths, easing gently further into each stretch as you breathe out.

Should I feel pain when I stretch?

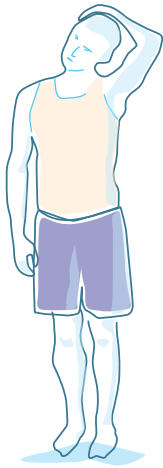
NO! You should feel a pull in the muscle, but NOT pain. Pain is likely an indicator of improper technique or taking the stretch too far – ouch!

How often should I stretch?

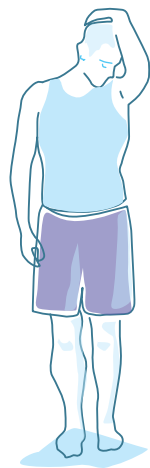
Current guidelines suggest that you should stretch twice per week to maintain range of motion in your joints. If you are feeling particularly tight in one or multiple areas, however, feel free to stretch more often, but be sure to keep the above advice in mind!

Stretches

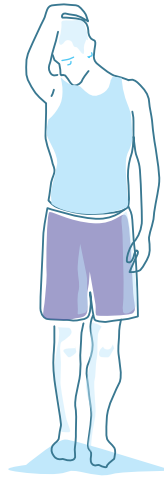
Neck & Shoulders



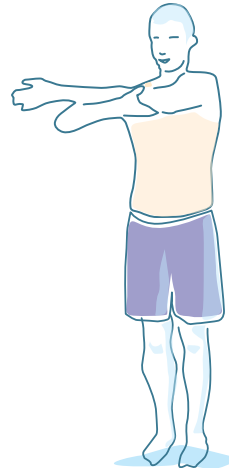
**Side of neck
& shoulder**



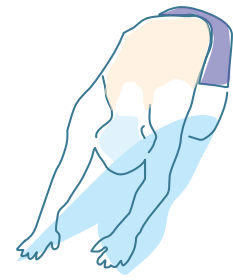
**Side back
of neck**



**Central back
of neck**

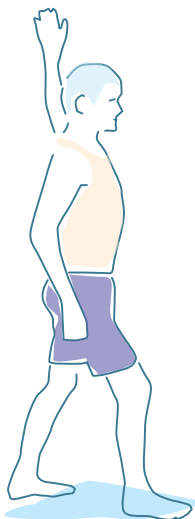


**Back of
shoulder**



**Lower
back**

Spinal



**Chest
Stretch**



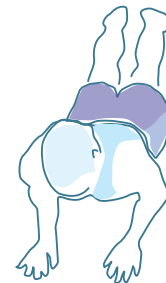
Side trunk



**Hip &
mid back**



**Lower back
& hip**



**Hip
flexors**

Exercise

Regular cardiovascular and twice weekly resistance exercise have been shown to improve both physical and mental health. Furthermore, recent research suggests that exercise in musicians prevents injuries, so get moving!

Define regular cardiovascular exercise?

Current guidelines recommend at least 150 minutes of weekly moderate intensity exercise, through sessions lasting at least 10 minutes. Frequent short bursts of regular exercise are still beneficial, not only long sessions.

Does intensity matter?

This depends on your exercise goals. Higher intensity exercise is necessary to increase fitness, but has not been consistently shown to have any physical or mental health advantages over moderate intensity exercise.

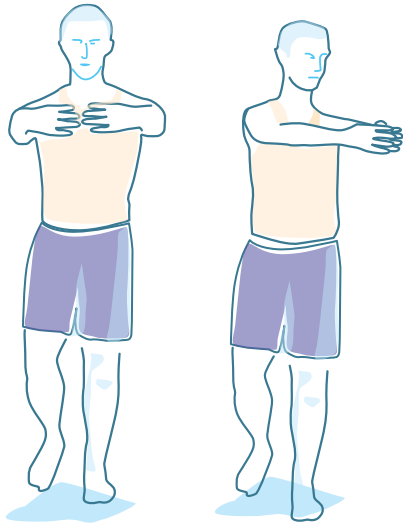
Do I really need to do resistance exercise?

YES! Musicians spend long periods of time in asymmetric postures when playing, and this causes muscle imbalances that can place stress on the body. Resistance exercise can help mitigate the effects of these playing postures by strengthening muscles that support and balance playing.

Any resistance exercise principles I should know?

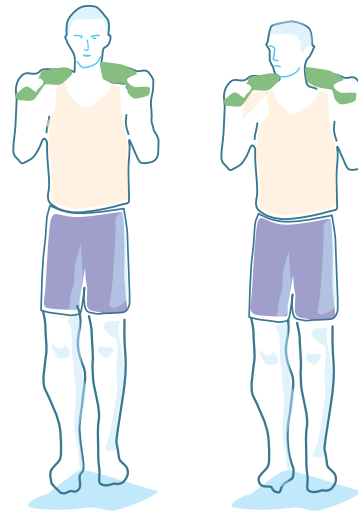
Glad you asked! A good general guideline is 2–4 sets of 10–15 low to moderate-intensity repetitions of exercises for each of the body's major muscle groups. BUT, avoid further loading on muscles already used extensively in performance. Also, space out your resistance workouts - 48 or more hours between workouts is necessary for better muscle recovery.

Resistance Exercises



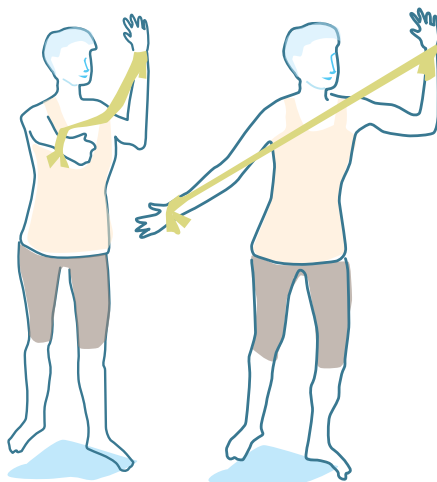
Hip

You can strengthen your hips by balancing on one leg, then bend the other leg up and maintain the pelvis/hip position as you turn your body one way, then the other.



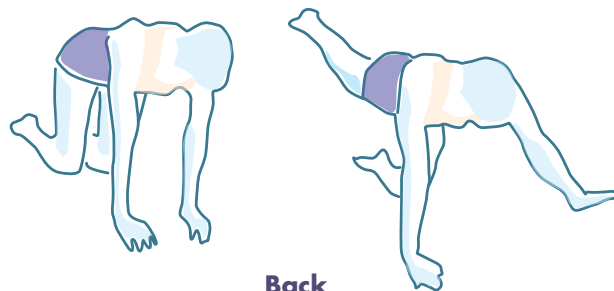
Neck

Standing with your back & head flat against a wall, feet a bit forwards, put a towel behind your neck & gently take your neck back as you nod down a little.



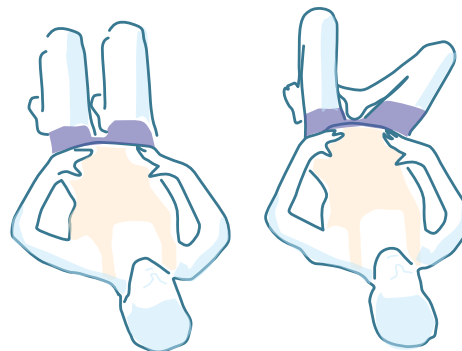
Shoulder

Use a resistance band to strengthen the muscles between your shoulder blades by moving arms outwards & chest forwards.



Back

Keep your abdominal muscles firm and back straight as you lift opposite arm & leg.



Abdominals

Gently draw your bellybutton towards your back. Breathe out and lower one knee out to the side without letting pelvis roll. Repeat to other side.

Nutrition

Taking care of your body by eating and drinking properly will allow you to gain the maximum from your practice and performance in addition to preventing injury

Healthy eating

- Tailor your eating plan to your practice and performance schedule - each individual is different!
- Don't skip breakfast! It helps with focus, concentration, metabolism, and your mood
- Try to eat from all 5 food groups (vegetables, fruit, grain, protein, dairy)
- Don't forget dairy! At least 2 daily servings of dairy helps prevent the development of brittle bones and osteoporosis

Hydration

- Proper hydration will help prevent early declines in concentration and performance due to fatigue
- Make sure you keep yourself hydrated at all times throughout the day. By the time you're thirsty it's too late - you've already lost 2% of your total body water!

Tips for practice and performance

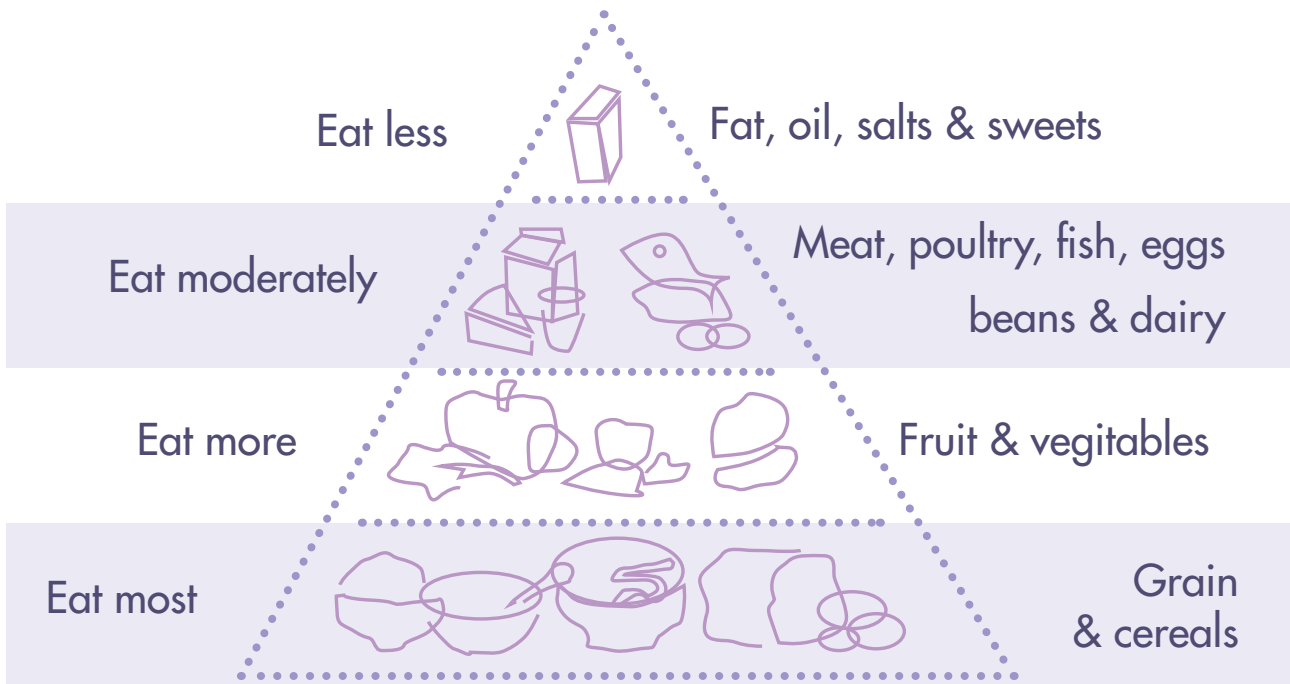
- Practice
 - Drink some water whenever you take a break from playing
- Pre-Performance
 - Drink ~400–500mls with your meal 3-4 hours before performance
 - Drink ~200–300mls ½ hour before performance to remain hydrated without needing the toilet during performance
- Post-Performance
 - Rehydrate with at least 500mls of fluid



Water is the best option unless you're sweating a lot or in a very warm environment - sports drinks are best for these situations.

Nutrition continued

Eating before performance



Post performance meals

- Within 30 minutes to 4 hours after performance you should eat a snack or meal containing both protein and carbohydrates—the sooner the better!
 - Carbohydrates replenish the glycogen stores in your liver and muscles
 - Protein allows for the re-synthesis of muscle protein
- EXAMPLES:
 - Bottle or cup of flavoured milk
 - Fruit smoothie
 - Yogurt and fruit
 - A sandwich with meat, chicken, or cheese
 - Nuts, raisins, trail mix, etc.
 - Baked beans on toast

Optimal Performance

Every musician wants to perform at his/her best. However, consistently reaching optimal performance can be elusive. Read on for tips on how to achieve your optimal performance.

What is optimal performance?

Performance quality is determined by a complex interaction between person characteristics (traits, physiological arousal, cognitions, emotions) task characteristics (task complexity and mastery), and performance demands/setting. When all of these characteristics occur at an optimally manageable level, the performer is said to be 'in the zone' or to have achieved a state of 'flow' – i.e., an optimal performance.

What is the ideal level of arousal in optimal performance?

The relationship between arousal and performance is complex but these general rules of thumb are helpful.

- 1.** A high level of arousal is essential for optimal performance in gross motor activities requiring strength, speed, and endurance.
- 2.** A high level of arousal impairs performances requiring a complex series of movements, coordination, fine muscle movement and concentration, as in musical performance.
- 3.** A slightly increased level of arousal over baseline (i.e. resting) is preferable for all motor tasks, including the activities of daily living, practice and rehearsal.

There is not a single level of optimal arousal for performance – rather, we aim to achieve arousal congruence, a concept that considers the ecology of each specific performance based on person, task and setting characteristics.

Optimal Performance continued



How do I achieve peak physical and mental condition?

The body of a performing artist is an integral part of their instrument. Just as you keep your instrument in top working order, it is necessary to keep your body fit and healthy.

What are you doing, eating, drinking, and thinking?

- Limit caffeine, alcohol, tobacco, sugar, and sweeteners (CATSS)
- Add protein—it builds neurotransmitters
- Eat green vegetables—they build new brain cells
- Eat regular meals
- Do not rely on multivitamins if diet is deficient; they produce expensive urine, and few other benefits
- Get enough sleep (at least seven hours per night is recommended)
- Enjoy intellectual stimulation away from musical activities. Certain practices built into one's regular routine provide a firm foundation for the achievement of optimal performance. These include:

Diaphragmatic breathing

- Activates parasympathetic nervous system – generates a feeling of calm
- Stops hyperventilation
- Practise daily for one minute blocks when needed (e.g., days leading up to performance)

Mindfulness

- Close eyes, inhale, notice each sensation, turn attention inwards
- Shift awareness to external world as you exhale

Relaxation and stretching

- Progressive muscle relaxation
- Cued relaxation for use in critical situations – activate the parasympathetic nervous system to counter the stress response
- Stretching is also protective and relaxing for bodies held in stressful and static positions

Exercise

- Keeps the body supple and strong and combats muscle fatigue
- Decreases impact of stress on body, uses fat and glucose released by the stress response, dissipates adrenalin, reduces circulating cortisol

Optimal Performance continued

How do I prepare for optimal performance?

Systematic practice that is deliberate, concentrated but spaced (shorter bursts with regular breaks) achieves the best results.

At a *mechanistic level*, to achieve task mastery, practice has three main goals:

1. Maximizing correct responses from the outset
2. Eliminating incorrect responses immediately, and
3. Encouraging maximal transfer from practice to performance

At a *psychological level*, practice must achieve:

1. Removal of external cues that interfere with attention. Management of psychological barriers.
2. Extinction of conditioned emotional responses to extraneous cues, such as emotional reactivity or rumination where errors occur.
3. Conditioning new responses to such cues (e.g., direct use of relaxation under conditions of arousal in conjunction with cognitive restructuring to deal with problematic thoughts).
4. Transfer to performance - not only are the skills learnt to automaticity, but the emotional responses attached to the performance of those skills are embedded in the skill itself.

At a *musical/aesthetic level*, practice must achieve:

1. Maintenance of a clear link between technique development and interpretative goals
2. A coherent personalized musical understanding of the work
3. Intrinsic enjoyment of and absorption in the music

Stress Management

As a musician, dealing with job-related stress is an occupational requirement. Below are some tips on how to effectively manage stress by defeating it at the source!

Are you thinking straight?

Managing a stressful event or situation requires a total body-environment approach. This involves 3 major components:

1. Accurately appraising the situation in which we feel stress
2. Managing the physical arousal that we experience when facing a stressful situation
3. Managing the thoughts (cognitions) that accompany our appraisal of the environment as stressful

This tip sheet focuses on the third component—our thoughts. Some thought processes help us to manage anxiety, while others increase our anxiety. These types of thoughts are called cognitive distortions, cognitive biases, and cognitive or logical errors.

What can I do about my cognitive distortions & thinking errors?

Recognize and challenge them. Ask, "Is this actually true?" Dysfunctional cognitive processes can be identified when an individual reports feelings of helplessness, hopelessness, anxiety, or a pervading sense of danger. Below are six common examples. Do any of these sound familiar?

I. Arbitrary interference

Impulsively draw conclusions when there is insufficient evidence to support the conclusion and even in the face of evidence to the contrary.

Example: A musician notices that the conductor looked in her direction with a frown on his face during rehearsal. She concludes that the conductor is critical of her playing and will report his dissatisfaction about her playing to the orchestra management.

II. Selective abstraction

Focus on a detail taken out of context, ignoring other, more salient features of the situation, and conceptualizing the entire experience on the basis of this one element.

Example: A concert pianist denigrated his whole two-hour recital because he made one mistake. For him, that one mistake had wiped out his entire performance and any merit that it may have had.

Stress Management continued

III. Overgeneralisation

Common logical error—a statement of belief in a general rule or principle that the person has derived from a set of very limited examples. Example: “I never play well under pressure or I always forget the words”.

IV. Magnification and Minimization

Magnification refers to the tendency to assign greater significance to negative events, evaluations or assessments than to positive events, which are simultaneously minimized. This pattern represents a systematic bias in thinking style that ensures that you can never feel happy with your achievements.

Example: A musician who auditions for a number of orchestras receives word that he has been accepted into one orchestra to which he has applied but rejected by two others for which he has auditioned. He becomes preoccupied with the rejections and ruminates as to the reasons that he has been rejected without taking time to celebrate his successful audition for an equally prestigious orchestra.

V. Dichotomous “all-or-none” thinking

Reducing our assessments of complex situations to “either-or” or “black versus white” algorithms. Example: This passage can only be played in the way I specify. There is no other way.

VI. Diminished ability to engage in perspective thinking

We need to develop the capacity to assess a problem from a number of different angles or from the point of view of other people, who might hold contrary views to our own. To do this, we need to be able to think about our own thinking processes, e.g., “I wonder why I thought that?”



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Psychological First Aid

In some cases, psychological treatment may be appropriate to help with the various stressors of life as a musician - read on for more information.

Do I need psychological help? If so, what sort of help do I need?

The stress in the professional musicians' work environment far exceeds that observed in other professions. Like elite athletes, performing artists must maintain their skills at peak form, endure many hours of solitary, repetitive practice, constantly self-evaluate their performances and subject their public performances to close scrutiny. Individuals vary in their capacity to cope with occupational, physical and psychological stressors and some people are more resilient than others. Difficulty in coping may be compounded for those who are generally highly anxious, who lack confidence in their abilities and who engage in unhelpful strategies to deal with their anxieties, such as the regular consumption of alcohol, and licit (e.g. beta blockers) or illicit (e.g. marijuana) drugs. Since music performance anxiety (MPA) is one of the most commonly reported psychological stressors in musicians, MPA will be the focus of this tip sheet.

Are there different types of MPA?

It is helpful to think of MPA as three related but different conditions that vary in severity and that include other psychological processes that must be attended to if treatment is to be successful and sustainable. Each type requires a different treatment approach.

I. Focal MPA

If possible, perform the repertoire for small groups of family and friends prior to the actual performance, and have sufficient rest and nutrition preceding the performance. Self-application of some cognitive-behavioural therapy techniques once taught by a qualified psychologist can also assist. These include relaxation/breath awareness/mindfulness, realistic self-appraisal and identification and challenge to cognitive distortions and thinking errors (see tip sheet – Are you thinking straight?)

II. MPA as part of a more general social anxiety

Some musicians feel anxious, not only in "focal" situations, but more generally, across most performance situations and in some social situations. Added to the strategies described for focal MPA, treatment may also involve several sessions with a suitably qualified psychologist who can assist with both the music performance and social anxiety simultaneously using primarily a cognitive behavioural approach (CBT).

Psychological First Aid continued

III. MPA as part of a Vulnerable Personality

A small group of musicians will experience more severe forms of MPA in the context of a vulnerable personality where depression and panic may also form part of the clinical picture. This group would benefit from more intensive psychotherapy which provides a reflective space in which one can make sense of one's experience, thereby gaining mastery over its detrimental effects on performance. CBT for specific MPA symptoms may be helpful after a period of intensive psychotherapy.

Manifestations of MPA

MPA presents in different ways; therapy interventions must address all its aspects.

1. *Somatic symptoms*¹ ➔ somatic strategies (reduction of sympathetic hyperarousal, including anxiety sensitivity reduction training)
2. *Cognitive symptoms*² ➔ cognitive strategies (reduction of cognitive biases and maladaptive perfectionism)
3. *Both somatic and cognitive*³ ➔ both somatic and cognitive strategies
4. Underlying psychological vulnerabilities (poor sense of self, low self-esteem, low self-efficacy, identity diffusion, depression) → dynamic psychotherapy

¹ *Somatic strategies*: Preparation (spaced practice), pre-performance routines, breathing, relaxation, physical fitness, adequate rest and nutrition, mindfulness; and medication, as an adjunct, in extreme circumstances.

² *Cognitive strategies*: Cognitive restructuring, cognitive challenges to dysfunctional thoughts.

³ *Dynamic psychotherapy*: Working within a therapeutic relationship to uncover and resolve early conflicts and traumas that are affecting music performance. Depression may also be a factor in MPA, which the therapy will also need to address.



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Performance Anxiety:

Beta (β) Blockers

30% of musicians suffer moderate to severe performance anxiety. In some cases, β -blockers may be an appropriate remedy - read on for more information

Medication for Music Performance Anxiety (MPA) what works, when, for whom?

Many musicians take medication, so it is important that you understand how and when medications work. This tip sheet will assist you with information about your options, but you should consult a medical specialist before commencing any medication for your MPA. You should also consider psychological therapies as the effects of medication are short term and do not teach you new skills or resolve underlying issues.

What are β -blockers?

β -blockers are prescribed for high blood pressure, cardiac problems or following heart attacks to reduce or block the effects of sympathetic arousal of the heart, including lowering blood pressure.

Why do performing artists use β -blockers?

Because many of the somatic symptoms of performance anxiety are mediated through the activation of the sympathetic nervous system, which β -blockers suppress, β -blockers have become increasingly popular among performers. β -blockers block the physical effects of the "fight/flight" response i.e., tremor, increased heart rate, sweating, flushing.

Will β -blockers benefit me?

β -blockers are most effective for reducing severe somatic anxiety such as palpitations, hyperventilation, tremor, shaking bow arm, trembling lips, sweating palms, and dry mouth. They are NOT effective for sleep disturbance, cognitive anxiety (worry, rumination, negative self-talk) or "free floating" or general anxiety. If you have a combination of both somatic and cognitive anxiety, β -blockers will assist with the somatic symptoms only.

How do I know which β -blocker to take, how much to take and when?

Propranolol (Inderal) is frequently prescribed for MPA but you should consult a physician to determine which type of β -blocker will be best for you. **β -blockers should NOT be used except under medical supervision.** Use is not advised for people with heart conditions, asthma, diabetes, and Raynaud's syndrome. Beta-blockers are most effective when taken 1.0-1.5 hours before performing.

Performance Anxiety:

Beta (β) Blockers continued

Are there any side effects of β -blockers?

Known side effects of regular use of β -blockers include low blood pressure, cold extremities, fainting, rapid heartbeat, dizziness, fatigue, headache, depression, sleep disturbance, short term memory loss, joint pain, and muscle cramps.

Are there any disadvantages of taking β -blockers?

β -blockers may have adverse effects on rhythmic control, emotional connection to the music, and overall performance quality. β -blockers do not enhance musical performance. β -blockers for wind instrumentalists and singers are not advised because the required respiratory exertion is "sapped" by β -blockers resulting in performance impairment.

Are there any other drug therapies that have been used for the treatment of MPA?

Anti-depressant medications should only be prescribed if there is comorbid depression, but NOT for MPA without depression. Benzodiazepines (i.e., anti-anxiety medication) are NOT recommended for MPA. All medications in these two classes of drugs may have significant side effects.



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Panic & Panic Disorder

Panic before or during a performance can be unsettling, but it doesn't have to be - read on for strategies to successfully manage panic and panic disorder.

What causes panic and panic disorder?

Four main causes:

- Trauma → hypersensitivity to threat
- Disruptions in attachment to parents/caregivers → insecurity
- Psychological conflicts → unable to solve tensions between competing needs
- Neurobiological causes → imbalance in neurotransmitters (genetic or physical causes)
 - Some children are born with a stress response that acts too quickly and too intensely
 - Children model anxious parents

What should I do if I experience panic?

Immediately:

- Sit down
- Think: "This is a panic attack; it is not a heart attack and I am not going crazy".
- Breathe: breathe out (do NOT breathe deeply)
- Take slower breaths (not deeper breaths)
- Wait five minutes—panic attack will burn out

Manage physiological panic triggers:

- Caffeine, alcohol, tobacco
- Sweeteners containing aspartame
- Low blood sugar
- Physical sensations—oversensitivity to bodily sensations (shortness of breath, dizziness, faintness, palpitations, sweating, flushing, numbness, tingling)
- Environmental factors (e.g. agoraphobia)
- Low serotonin (smiling, laughing and having fun increases serotonin levels)

Panic & Panic Disorder continued

Address cognitive panic triggers

- Common thoughts of people experiencing panic attacks:
 - I am having a heart attack
 - I am going crazy
 - I will lose control
 - I am going to die
- Change cognitions "I am having a panic attack. I will use my management strategies and it will pass in five minutes".
 - "Fear is unpleasant, but not lethal"
- Control excessive thinking
 - Excessive thinking results in decreased serotonin in the right brain, which generates unhelpful "thought loops" that prevent problem solving
 - Control worries - often related to:
- Unrealistic perfectionism
- Excessive need to be in control
- Fear of the unexpected

Address underlying emotions & psychological vulnerabilities

- Work through:
 - Damaged attachment relationships
 - Past traumas
 - Psychological conflicts



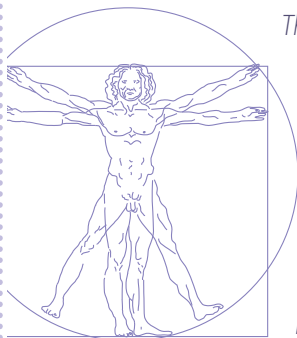
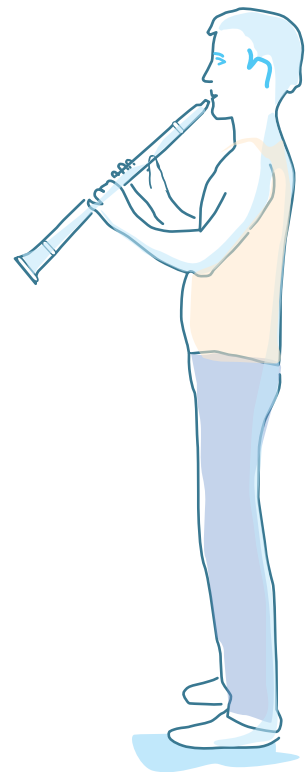
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Standing Posture

Standing Posture Playing with “good posture” is often advised but rarely defined. This tip sheet outlines key postural principles to help perfect your standing posture and solidify the physical foundation for your playing!

Checklist for performance standing posture

- ✓ Feet hip width apart, toes pointing out slightly
- ✓ Head should be balanced above the shoulders
- ✓ Bring the weight of the instrument to you, unlock knees and make sure your hips have not swayed forwards.
- ✓ Wear supportive shoes that help you maintain your best posture
- ✓ Check that your weight bearing is fairly even through both the left and right feet, and feel how the weight can be transferred between the balls and arches of your feet.
- ✓ The weight off the instrument (where applicable) should feel that it travels down through the body to the arches of the feet



The traditional medical view of standing posture is that the body is aligned so that the pull of gravity is balanced down through the curvatures of your spine, passing through the knee and hip joints then into your feet. The feet allow weight shifting back and forth and side to side into the balls and heels by simple swaying actions that require little work from body muscles. This swaying allows the gravity forces to continue to travel through the body in a way that reduces muscle effort in holding the musician or instrument upright. This weight transference should logically follow the movements and instrument support requirements of performance.

Standing Posture continued

Tips to help with standing alignment

1. Standing with each foot on a set of scales can help you get the feel of even weight bearing.
2. Stand on an uneven surface before practicing (such as a trampoline, pool noodle, foam roller, air discs, cushions or similar) to help in unlocking the lower limbs and back. This can help relax tension.
3. If you are not sure about your head and shoulder alignment, before you play stand with your back against the wall, feet about a foot length out from the wall and knees bent. Then step away from the wall and try to increase your awareness of this position by trying to feel the support of your upper body weight by your lower body.
4. Sway in different directions while standing in playing position to feel the weight travelling to each ball and heel of both feet.
5. Check alignment in a mirror (and/or take a photo from side view too).
6. When you start warming up your playing, spend a little time focusing on letting your body weight shift a little to support your playing action. Consciously allowing weight shift initially helps to maintain it during practice.



Sitting Posture

Orchestral musicians frequently experience pain due to the high physical demands of hours of daily repetitive playing actions. Pain is our body's way of telling us that something has gone wrong and needs to be addressed.

Having "good performance posture" is about adopting a position that requires the least effort to keep you upright and best provides a base for all necessary playing movements.

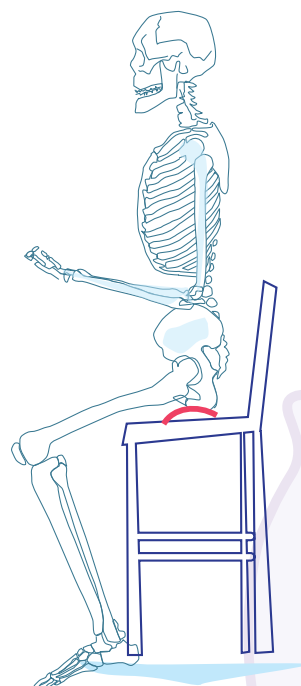
Postural Basics

In general, for good posture:

- head above the shoulders
- shoulders above hips, but this may need to slightly adapt by a weight sway forwards or backwards from your postural base of support to counterbalance arm movements and/or instrument weight.
- Sitting on the bones along the base of your pelvis reduces postural muscle effort. The so-called 'sitz' bones in the buttock crease are at the back of what is essentially a supportive bony cross.



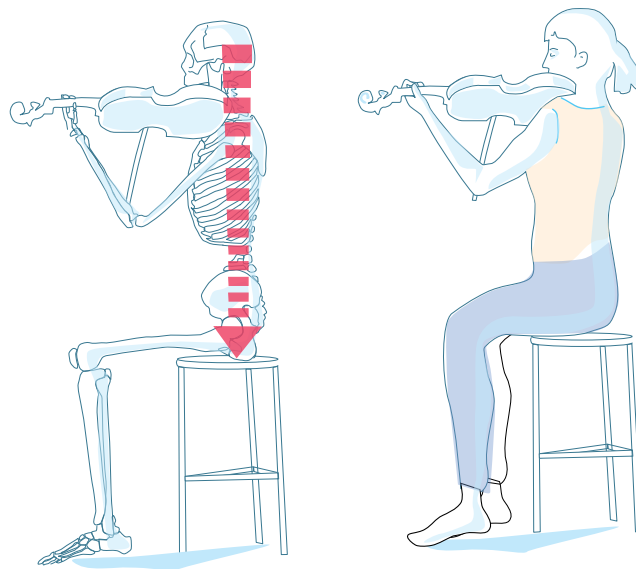
x marks the spot for good sitting posture!



Sitting Posture continued

Tips to help with alignment when seated

1. Stick your bottom out when you sit down. You should land between the buttock crease at the back and the pubic symphysis at the front.
2. Weight should be evenly balanced between sides.
3. Position your feet where you could stand up straight away if needed.
This reassures your body that your feet will be able to help support your weight when you move to play.
4. Try to slouch—if you are sitting on the right parts of your pelvis, it should be hard to slouch even if you try to do so.
5. Bend forwards and check that movement automatically happens at the hips.



Checklist for performance sitting posture

- ✓ Use the best supportive chair that helps you maintain your ideal posture
- ✓ Adjust the chair to allow for the effortless movements required for performance
- ✓ You should feel your pelvis bones on the seat and be able to shift weight from them into the thighs and back without bending your back



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Hearing Health

Proper care of your ears will keep you enjoying beautiful music for years to come! To maximize your long-term auditory health, keep the following tips in mind

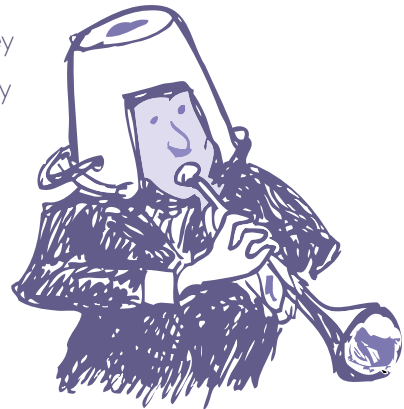
Earplugs

- Custom-fit musician's earplugs from an audiologist who understands the needs of musicians are a tool of the trade.
- Practice with your plugs in, both to reduce your exposure and get used to the different sound and feel.
- Always carry your plugs with you – you never know!



Earplug Adjustment

- Plugs that are too strong (over-attenuated) tend to be used less than they should. If you find your current plugs impossible to use discuss the possibility of weaker filters with your audiologist.
- Occlusion – or too much of your own sound in your head while you are playing – is a common problem with earplugs, but it can be overcome with deeper fitting earplugs or special non-occluding filters.



Hearing Health continued

Practice/Performance

- Make sure your practice room is appropriate. Avoid practicing in highly reverberant rooms.
- Risers, increased distance from the sound source and/or absorbent wraparound screens are all effective ways to reduce exposure from sound to the rear.
- Try to avoid the use of Perspex sheeting – it can cause problems for those ‘upstream’ and typically has only a limited on your sound exposure.
- Give the ears twenty-four hours to recover after a heavy gig.
- Remember (unless you play cello, bass or harp) your own instrument is often the source of your highest sound exposure over the course of a rehearsal or a concert.

General Tips

1. Hearing damage is cumulative – reducing your exposure time is as important as reducing your exposure level.
2. Remember all sound contributes to your exposure – from circular saws to a heavy-metal concert. Keep track of your exposure with a personal dosimeter or smart-phone app.
3. See an audiologist every twelve months or sooner if you notice any change in your hearing sensitivity or level.



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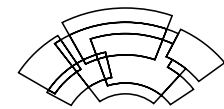
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