

VIOLIN AND YOGA:
BENEFITS OF YOGA FOR VIOLINISTS.

by

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A DOCUMENT

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ABSTRACT

Today, performing musicians face many challenges that require them to push the limits of what is possible both mentally and physically. They are expected to reach ever-higher levels of technical proficiency; what seemed virtuosic or even impossible a few decades before soon becomes standard. One must know an increasingly wide repertory and practice and perform in an expanding world in which travel can be a constant drain on time, energy, and concentration. Under these conditions the pursuit of perfection can become a hindrance for many artists who, in the process, lose the joy of performing and the ability to do their best under such difficult circumstances; they can also become more prone to injury.

A growing body of evidence from physicians, physical therapists, and other medical experts, as well as the testimony of musicians, indicates that Yoga has been used successfully in the prevention and treatment of injury, and to remedy psychological problems such as performance anxiety and lack of concentration.

This paper identifies specific injuries encountered by performing string musicians, and reports on successes in treatment of these injuries with Yoga as recorded in medical sources, reported by Yoga therapists, and documented by musicians themselves. In each case, this evidence is followed by my own suggestions for beneficial Yoga poses and practices drawn from personal experience and from interviews with Yoga teachers. Following the discussions of

physical injuries, I include a chapter documenting the effectiveness of Yoga in treating psychological challenges such as performance anxiety. I close with a summary of my findings, offering Yoga as a valid and successful avenue for musicians dealing with these problems.

DEDICATION

To my mother, with love.

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CHAPTER 1

INTRODUCTION

Today, performing musicians face many challenges that require them to push the limits of what is possible both mentally and physically. They are expected to reach ever-higher levels of technical proficiency; what seemed virtuosic or even impossible a few decades before soon becomes standard. One must know an increasingly wide repertory and practice and perform in an expanding world in which travel can be a constant drain on time, energy, and concentration. Under these conditions the pursuit of perfection can become a hindrance for many artists who, in the process, lose the joy of performing and the ability to do their best under such difficult circumstances; they can also become more prone to injury.

A 1988 survey conducted by Martin Fishbein and Susan Middlestadt examining 2,212 members of the International Conference of Symphony and Opera Musicians showed that during their careers, 76% of performers experienced at least one serious medical problem which affected their professional abilities.¹ Langendoerfer et al., as well as the Wan and Huon studies, revealed that musicians commonly experience stress-induced problems such as performance-related musculoskeletal conditions and

¹ Fishbein and Middlestadt, "Medical Problems Among ICSOM Musicians," 1-8, quoted in Paull and Harrison, *The Athletic Musician*, 3-4.

performance anxiety, which negatively impact their ability to perform.² A number of recent survey studies have demonstrated that performance anxiety affects as many as 69% of musicians.³ In an effort to reach and maintain a professional level of proficiency on any instrument as measured by today's increasing expectations, performers often develop habits that can cause injury and retard development: they fall victim to the physical and mental effects of stress, suffering from physical tension as well as diminished levels of concentration. Musicians may lack physical strength, knowledge of how the body works, or appropriate training. These weaknesses may contribute to the inability to control the body and maintain safe and effective physical posture, preferably as close to anatomically neutral as possible, while playing an instrument.⁴ Unnatural posture alone can be a cause of many injuries such as shoulder impingement or thoracic outlet syndrome. The most common among musicians are overuse injuries which do not result from faulty technique but simply from extended periods of time spent on repetitive motions. The factors mentioned above make a musician's situation difficult, threatening possible physical injuries and a lack of mental focus, which in turn can jeopardize and even ruin a professional career.⁵

² Langendoerfer et al., "Personality and Performance Anxiety," 162-171; Wan and Huon, "Performance Degradation under Pressure in Music," 155-172; both quoted in Khalsa et al., "Yoga Ameliorates Anxiety and Mood Disturbances," 280.

³ Cox and Kenardy, "Performance Anxiety, Social Phobia, and Setting Effects in Instrumental Music Students," 49-60; Fehm and Schmidt, "Performance Anxiety," 98-109; Miller and Chesky, "The Multidimensional Anxiety Theory," 2; all quoted in Khalsa et al., "Yoga Ameliorates Anxiety and Mood Disturbances," 280.

⁴ Paull and Harrison, *The Athletic Musician*, 51.

⁵ Clark, "Performance-Related Medical and Psychological Disorders in Instrumental Musicians," 28-34, quoted in Khalsa et al., "Yoga Ameliorates Anxiety and Mood Disturbances," 280.

Published documentation and my own experience provide evidence that the practice of Yoga and other techniques that center on both mental and physical aspects of human performance can be beneficial to all musicians in countering these problems, as well as in enhancing any performer's abilities. Among classically trained musicians, Yehudi Menuhin was the first famous proponent of Yoga, and is particularly significant to this study as he was a violinist. For many years he collaborated with B.K.S. Iyengar, a renowned Yoga master, and incorporated many Yogic techniques as well as the philosophy of balance into his own practice and pedagogical output.⁶ Here are some of Menuhin's insights on Yoga and the violin:

In my life Yoga is an aid to well-being, permitting me to do more and to do better. First and foremost, of course, Yoga made its contribution to my quest to understand consciously the mechanics of violin playing....In a year and a half of idleness in California which closed my first decade of touring, my worry reached a peak: having left my violins in their cases for some weeks, I found on unpacking them again that I could not be sure of promptly re-establishing intimacy. One day my fingers had their old reassurance, another they fumbled...What had happened was a break in sequence. Between musical vision and its communication, a transition hitherto made intuitively, there occurred a rupture.⁷

Menuhin found many solutions to his questions in the teachings of Yoga. Among many results of Yoga practice, he lists the following:

less tension, more effective application of energy, the breaking down of resistance in every joint, the coordination of all motions into one motion; and...the profound

⁶ Menuhin, *The Compleat Violinist*, 2, 14-23, 38-53.

⁷ Menuhin, *Unfinished Journey*, 248-51.

truth that strength comes not from strength but from subtle comprehension of process, of proportion and balance.⁸

Menuhin also stated that behind all violin technique exercises and hours of practice, the main goal is improved awareness,⁹ and that is the very goal of Yoga practice.

As a violinist, I particularly recognize the benefits of Yoga as they relate to the study and performance of that instrument. By discussing the most important challenges that musicians face and solutions provided by Yoga philosophy, this paper will demonstrate how the practice of Yoga directly benefits violinists at any level of development by preventing many of the problems in the categories stated above, by helping those who have already fallen victim to them to become healthy performers, and by enhancing the musician's performing skills at any level. Holding the assumption that mind and body both need to be addressed in order to achieve successful results, I believe that Yoga can be a valid alternative to other existing methods such as Alexander Technique or Dr. Greene's approach in *Performance Success: Performing Your Best Under Pressure*. In my opinion, only Yoga truly develops both the mental and physical faculties, while other methods tend to concentrate more on one or the other.

Yoga is one of the six fundamental systems of Indian thought. The first mention of this discipline was documented in ancient Hindu scriptures 5,000 years ago, specifically in the *Rig Veda*. The Yoga philosophy is not associated with any religion. The *Yoga Sutras* of Patanjali (the collection of 195 aphorisms coming from the second

⁸ Daniels, *Conversations with Menuhin*, 185.

⁹ Menuhin, *Unfinished Journey*, 251.

century CE) is the classical and most revered text of modern Yoga tradition. Many different interpretations of the word Yoga have been passed on over the centuries. The etymology of Yoga is derived from the Sanskrit verb *yuj*, meaning “to unite or join together.” T. K. V. Desikachar states that another interpretation of the word Yoga implies “to attain what was previously unattainable.”¹⁰ The goal of Yoga was originally to provide a guide for wholeness, which was understood as the integration of body, mind, and spirit. In Yoga philosophy, humans are viewed as consciousness-energy, and the practice of Yoga was thought to lead to self-transformation and liberation from illusion.¹¹ Depending on the approach and incorporated techniques, 40 different styles of Hindu Yoga have been reported; for example, *Dhyana Yoga* places the greatest focus on meditation, while *Mantra Yoga* is based on the practice of repetitive sounds. The types of Yoga most known in the western world originated from *Hatha Yoga*, which was a major branch of Yogic tradition that developed around 1000 CE. *Hatha Yoga* emphasizes physical movement and breath control. There are also many types of Yoga within the *Hatha Yoga* style, in particular *Iyengar Yoga*, *Ashtanga Yoga* or *Viniyoga*, which will be most useful for this document. For more information on the variety of Yoga styles see Figure 1.1.¹²

¹⁰ Desikachar, *The Heart of Yoga*, 5.

¹¹ White, “Yoga for Children” citing Feuerstein, *The Deeper Dimension of Yoga*, 277.

¹² *Ibid.*, 279.

HATHA YOGA STYLES	DESCRIPTION
Ashtanga (Power)	Focuses on strength and flexibility training.
Iyengar	Uses props such as blocks and straps. The focus is on correct execution and alignment of <i>asanas</i> .
Viniyoga	The individual's physical and mental abilities dictate what sequences of poses are used. The focus is on coordination of breath and <i>asanas</i> .
Bikram	Designed for physically fit individuals. Includes vigorous postures in standard sequence in a room heated up to 110 degrees F.
Kripalu	Consists of 3 three stages that are suggested for Western students: the first breath and body awareness, the second holding poses for a longer time, the third meditation in motion (involves spontaneous unstructured motions).
Kundalini	Techniques such as <i>asanas</i> , breath control, chanting and meditation is used to awaken the innate energy.
Integral	The focus is on the function of the practice rather than explicit forms.
Sivananda	Series of 12 postures including chanting, relaxation and breathing exercises
Ananda	Uses various Yogic techniques to consciously direct the life force to all parts of the body.
Hidden Language	Concentrates on the study of the symbolism in the postures.
Somatic-integrated	Slow <i>asanas</i> practiced along with visualization and conscious breathing.

Figure 1.1. Styles of Yoga, adapted from Santangelo White, "Yoga for Children," 279.

Yoga consists of specific techniques including various body postures or exercises (*asanas*) that are coordinated with breathing, meditation, and concentration to focus and calm the mind. The Yoga masters observed the intimate relation between the breath and state of the mind, and thus the art of the breathing (*pranayama*) became an integral part of the practice. The *asanas* are meant to increase flexibility and strength, and to improve

functioning of the endocrine, gastrointestinal, and immune systems, as well as eye-hand coordination. The practice of *asanas* also has positive psychological effects that include an increase in somatic awareness, memory, the ability to focus mentally, learning skills, and mood.

My criteria for selecting the most beneficial poses are based on the degree to which they develop skills necessary for successful practice and performance on the violin. I will include a collection of poses having direct impact on cultivating healthy posture while playing the violin. Many musicians are unable to maintain such posture, or even to find it since they lack the awareness of how it should feel and do not have the sufficient muscular balance and strength. I believe this could be solved by the systematic practice of standing poses for posture such as *Tadasana* (Mountain Pose).-Poses such as *Garudasana* (Eagle Pose), *Urdva Mukha Svanasana* (Upward Dog Pose), and *Gomukhasana* (Cow Pose) would be of assistance in strengthening the wrists and hands and removing of stiffness in the shoulders.

Chapter 2 of this paper will discuss the significance of the correct body posture for musicians, both sitting and standing, followed by an investigation of what comprises such a body stance for violinists specifically, as reported by a variety of medical authorities and prominent music teachers. Examples of Yoga's usefulness will be provided by drawing upon an interview with renowned Yoga master Robert Boustany, and on other available sources such as Mia Olson's *Musician's Yoga* and Eleanor Winding's *Yoga for Musicians and Other Special People*. The chapter will close with specific examples of Yoga poses that promote balanced body posture. Chapter 3 will

address the shoulders and neck area. Chapter 4 will focus on the area of the hands, wrists, and elbows. Both will include anatomic descriptions of these parts of the body as they pertain to violinists; an investigation of the most commonly occurring injuries, including their causes, symptoms, and methods of prevention; and available scientific research on benefits of Yoga when battling these conditions. Both will conclude with selections of *asanas* that I found to be most beneficial for these particular challenges. Chapter 5 will examine the psychological aspects of performance that are most trying for musicians, such as performance anxiety, effective practice techniques, and preparation for concerts. This chapter will also provide a short review of scientific research on Yoga and its psychological effects, as well as specific studies on Yoga and musicians. The views of important authorities on these issues will be included. In closing, I will share my own experience with Yoga and its benefits for me as a violinist.

CHAPTER 2

POSTURE

Introduction

What is a correct body posture, why is it so difficult to achieve and maintain, and why is it important for musicians? This chapter will address these questions; examine answers given by various authorities including physicians, physical therapists, violinists, and Yoga teachers; and propose a selection of ways in which Yoga practice offers solutions related primarily to violinists.

In her study of the prevention and treatment of postural deformities, Tijana Purenovic states that the importance of correct (upright) posture has been noted since the early 1900s when it was described as a state of balance requiring minimal muscular exertion to maintain.¹³ Since then numerous efforts have been made to formulate the criteria that would sufficiently serve as a foundation for establishing the ideal postural alignment. Throughout the twentieth century, an understanding of the significance of good posture and its correlation with efficient playing and injury prevention has grown.

¹³ Purenovic, “Yoga Asanas,” 2.

Correct Body Posture

Before examining the most effective playing position for the violinist, I will employ the writings of various authors to describe the principles of healthy posture in general. Currently, physiotherapists most commonly use a standard for normal alignment described by Florence Kendall, Elizabeth McCreary, and Patricia Provance.¹⁴

In order to describe good posture, Kendall, McCreary, and Provance employ the idea of a “plumb line,” a vertical line which serves as reference for the alignment of the entire body. The authors explain that the “plumb line” is a tool used in the science of mechanics and represents a standard that is based on the laws of gravity. According to their model, the reference points, including areas such as the lobe of the ear, the seventh cervical vertebra, the shoulder joint, the midline of the knee, etc., form this theoretical “plumb line” around which the body is balanced in perfect skeletal alignment, yielding equal weight distribution and maximum joint stability.¹⁵ See Figures 2.1 and 2.2.

¹⁴ Kendall, McCreary, and Provance, *Muscles, Testing and Function*, 3.

¹⁵ Kendall, McCreary, and Provance, *Muscles, Testing and Function*, 3.

Figure 2.1. The chart illustrates “healthy and faulty posture.” Adapted from Kendall, McCreary, and Provance’s *Muscles, Testing and Function*, 115-116.

Part of the Body	Healthy Posture	Faulty Posture
Foot	<p>While standing, the longitudinal arch has the shape of the half dome. Barefoot or in shoes without high heels, the toes should be out slightly. In shoes with heels the feet are parallel.</p>	<p>The longitudinal arch is low or flat-foot. Low metatarsal arch. “Ankles roll in.” Weight on the inner side of the foot. “Ankles roll out.” Weight on the outer side of the foot.</p>
Toes	<p>Should be relaxed and straight (neither curled downward nor bent upward).</p>	<p>Toes bend up at the first joint and down at middle joints. Big toe slants inward toward the midline of the foot.</p>
Knees and Legs	<p>Legs are straight. Kneecaps face straight ahead when feet are in proper position. Looking from the side, the knees are neither bent forward nor locked backward.</p>	<p>Knees touch when feet are apart. Knees are apart when feet touch. Knees bend backward. Knees bend slightly forward.</p>
Hips, Pelvis, and Spine (When Viewed from the Back)	<p>Ideally, the hips are level.</p>	<p>One hip is higher than the other. The hips are rotated.</p>

Part of the Body	Healthy Posture	Faulty Posture
Spine and Pelvis (Side View)	<p>The natural curves of the spine are preserved (the neck area and lower back have a forward curve; the upper back and the lowest part of the spine, a backward curve). The front of the pelvis and the thighs are in a straight line.</p>	<p>The natural forward curve of the lower back is flattened. Increased backward curve of the upper back (kyphosis). Increased forward curve of the neck, usually accompanied by a round upper back and observed as a forward head. Lateral curve of the spine.</p>
Abdomen	<p>The abdomen should be flat in adults and in children above the age of ten.</p>	<p>Either the entire abdomen or the lower part protrudes.</p>
Chest	<p>Slightly up and forward, the chest appears to be in a position halfway between that of a full inhale and a forced exhale.</p>	<p>Depressed position. The back arches and the chest is held up too high. The ribs are more prominent on one side than on the other.</p>
Arms and Shoulders	<p>Arms hang relaxed at the sides of the body; palms are facing toward the body, and elbows are slightly bent. Shoulders are at even height and neither one is more forward or backward than the other when observed from the side. Shoulder blades lie flat against the rib cage. They are about four inches apart from each other (in average adults).</p>	<p>Arms are held stiffly in any position: forward, backward, or out from the body. Palms face backward. Uneven shoulders. Shoulders are rotated either clockwise or counterclockwise. Shoulder blades pulled back too hard. Protruding shoulder blades.</p>
Head	<p>The head is held in a balanced position</p>	<p>Protruding chin. The head juts forward or is tilted to one side.</p>

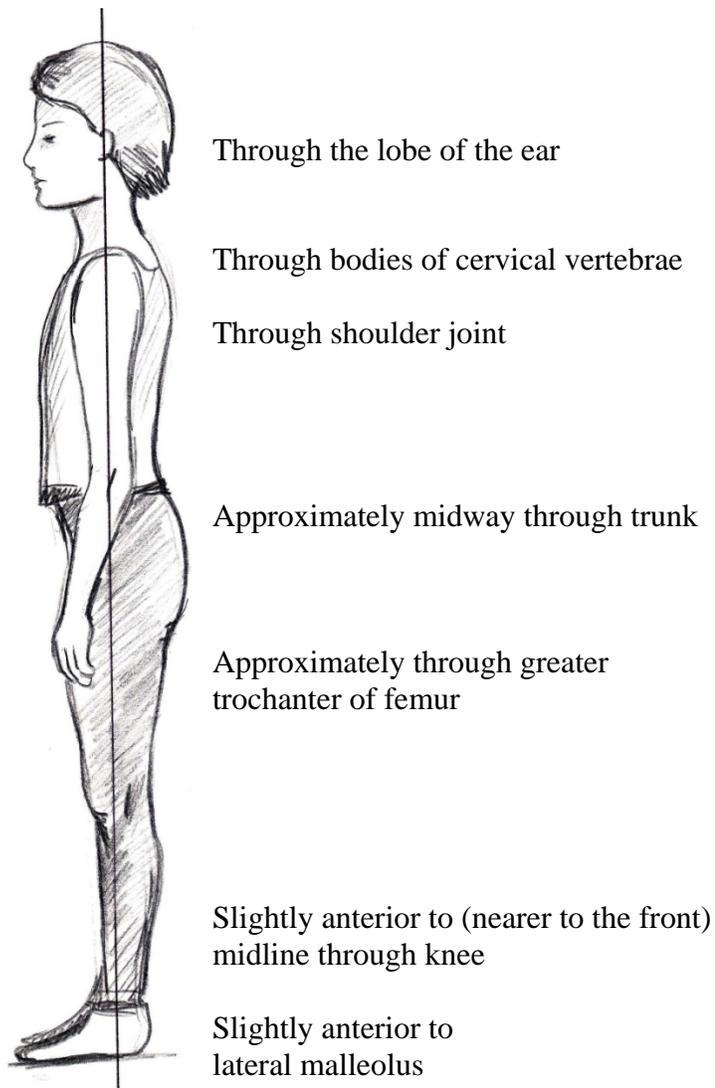


Figure 2.2. Illustration of the “plumb line” alignment. Adapted from Kendall, McCreary, and Provance’s *Muscles, Testing and Function*, 75.

Emil PASCARELLI and Deborah Quilter defined good posture as the following:

the ability to maintain proper alignment of the bones and length of the muscles through motion... Good posture really means balanced use of the muscles, ease of

movement, and freedom from pain...In order to accomplish this, muscles need to be stretched and toned.¹⁶

Correct Posture for Musicians

Doctors Raoul Tubiana, Patrick Chamagne, and Roberta Brockman examined over 200 musicians in an attempt to determine healthy physiologic postures for instrumentalists.¹⁷ They pointed out that solid support is necessary for freedom of fine (small muscle) movement. An exemplary body position while standing or sitting puts minimum stress on the body and also requires minimal energy or muscle effort to maintain. Through skeletal and ligamentous structure, acted on by a system of agonist and antagonist muscles, the body fights against forces of gravity in order to remain upright. Playing an instrument often requires departure from physiologically neutral positions. Tubiana, Chamagne, and Brockman, among others, stress that such deviations need to be only momentary so as to ensure efficiency and safety. The dynamic equilibrium of interactions between the pairs of muscles and the bone structure is controlled by different levels of the brain. The cortex is in charge of conscious movements, while the subcortical areas direct automatic movements; the authors state that maintenance movements such as posture become automatic to allow the conscious mind to focus on other more subtle tasks. The problems arise if, by habitual repetition,

¹⁶ Pascarelli and Quilter, *Repetitive Strain Injury*, 30.

¹⁷ Tubiana, Chamagne, and Brockman, "Fundamental Positions for Instrumental Musicians," 192-94.

the wrong habits are incorporated at the unconscious cerebral level and cause modification of the normal movements of all the muscles of the hands, the arms, and possibly of the whole body. This fact is of great importance for musicians to recognize; fostering faulty or inefficient motions while practicing or performing will eventually ingrain them into the subconscious mind and make them part of the musician's technique. At that point, the musician may no longer be aware of making these erroneous movements. For more information on this subject see p.17.

Tubiana, Chamagne, and Brockman describe the basic standing posture starting with positioning the feet flat on the floor and spread apart the distance between the width of the hips and shoulders, thus providing a stable tripod formed by the base of the big toe, the base of the little toe, and the heel. According to the authors of the article, the correct position of the pelvis is achieved by a slight backward tilt (retroversion), and that requires abdominal muscle tone. They believe that such positioning of the pelvis together with the head held straight allows the spine to fall into natural alignment. The sitting position is more stable since the body's weight is supported by the feet, thighs, and the ischia (sitting bones) of the pelvis. Physiotherapist Barbara Paull stresses that to prevent injuries it is of utmost importance for musicians to obtain a posture as anatomically correct as possible to allow joints of the body to function in the most neutral position possible.¹⁸ She emphasizes the need to preserve the natural curves of the spine that secure our upright position and protect us from the effects of both gravity and the frequent bending forward required by everyday activities. Paull deems the curve in the

¹⁸ Paull and Harrison, *The Athletic Musician*, 27-50.

neck (cervical area) and the other in the lower back (lumbar area) the most significant parts of the spine, but also the most susceptible to injury. Maintaining these curvatures protects the discs from herniating and adds strength and stability to the spine. Excessive and prolonged twisting or bending of the spine causes the fluid inside of the discs to bulge and eventually press either on the spinal cord or on the pairs of nerves that pass towards various parts of the body.

It is worth noting that the nerves that originate at the cervical area and travel down under the big neck muscles, across the top of the first rib, the armpit, and down the arm, affect and control the finger action. This means many hand injuries may, in fact, originate from faulty spinal alignment. Paull observes that good posture should not be static and needs to include micro— and macro— movements because our bodies need to move to avoid an accumulation of tension. To find the healthy standing posture, Paull suggests standing up as tall as possible, relaxing the shoulder girdle while avoiding forcing the shoulders backwards in exaggerated military position, and breathing normally. The head needs to be balanced on the neck and should not protrude forward ahead of the body. Lifting the sternum allows one to stand tall effortlessly. Paull disagrees with the application of the pelvic tilt, since she believes it neutralizes the natural lumbar curve. The knees should be straight but not locked, and the weight of the body should fall in front of the feet.

Reasons for Faulty Posture

If correct posture can impact so many elements of performance—the level of success, injury prevention, etc.—then why must so many musicians struggle to maintain it? Many authors such as Harrison, Horvath, and Tubiana state that a variety of factors contribute to the cultivation of poor posture among musicians: prolonged positioning in incorrect postural alignments, most especially during hours of practice; a general lack of postural awareness; and misconceptions about proper posture. The study and practice of correct posture may be neglected for such reasons as working under stress, attempting to achieve certain goals too quickly, rushing instead of letting the natural process of learning happen, and not allowing proper breaks for the body to recover after work.

F. M. Alexander blamed a highly civilized way of life for the gradual loss of our ability to judge our actions as they relate to our bodies, and specifically, the ability to keep a healthy posture as we play our instruments.¹⁹ Alexander viewed the body as a whole (including both the psychological and physical aspects), and considered correct posture to be the correct “use” of the body. He discovered that modern people no longer rely on instincts to accurately discern how we use our bodies. Often from an early age, through attempting to accomplish teachers’ assignments and adhere to given instructions, musicians lose the capacity to perform naturally. With time we become slaves of our habits, unable to respond correctly to the challenge, merely limited to unconscious reaction. These harmful habits inhibit our most proficient actions and may lead to

¹⁹ Alexander, *The Use of the Self*, 21-55.

injuries. Through his scientific observation, Alexander came to conclusions similar to those reached decades later in the field of medicine and discussed by Tubiana, Chamagne, and Brockman: repetition causes movements to become habitual and unconscious, or in medical terms, controlled by the subcortical parts of the brain. This is why it is so difficult to correct faulty habits or posture; we are no longer aware of our bodies' positions or of how they move. See Chapter 5 for more information on unlearning harmful habits.

Correct Posture for Violinists

Meeting the physical requirements necessary for playing the violin presents additional, distinctive challenges related to the positions and movements required of the arms. Also, the manner in which the instrument is held involves slight twisting of the neck and head, which can be injurious when overdone. Supporting the weight of the violin and the arm without unnecessary pressure requires correct placement of the shoulder and shoulder blade. Tubiana, Chamagne, and Brockman stress the importance of the proper alignment of the shoulder and explain that, in truth, the area commonly known as the shoulder is actually comprised of two joints —the scapulothoracic girdle and the glenohumeral joint. The scapulothoracic girdle is a major muscular structure supporting the arm and consequently the violin, and is also responsible for establishing correct shoulder axis. The lateral (moving farther away from the axis of the body) gliding and posterior (moving closer to the back of the body) rotation of the shoulder

blade (scapula) insures better stability and greater freedom of movement at the glenohumeral joint. The authors warn that without proper positioning and support at this level, fine control of hand movements is inefficient, if not impossible.

In her book entitled *How Muscles Learn*, Susan Kempter, renowned violin teacher, lecturer, clinician, and specialist in the interdisciplinary applications to music teaching and learning, emphasizes the significance of teaching proper posture to violin students and believes it needs to be achieved before even trying to play an instrument.²⁰ For Kempter, it is an absolute basis, a fundament on which a great technique must be built. In addition, she believes that well-balanced posture needs to be analyzed on individual bases and that the mere attempt of standing up straight, or the NEST method (named so for the first letters of alignment points forming a vertical line: Nose, Elbow, Scroll of the violin, Toe) is not sufficient. According to Kempter, such routines possess the potential to produce tension and inefficient movement patterns.

Kemptoner considers Lynn Medoff's suggestions found in her article "The Importance of Movement Education in the Training of Young Violinists" as the most useful descriptions of good posture for violinists. Medoff, similarly to Kendall and McCreary, proposes that balanced and centered posture equates to the organization of the body around its central axis, which assures efficient transfer of the body weight towards the ground.²¹ She explains simply that the trunk, the head, the arms, and the legs make up the skeletal framework. The trunk is divided into three weight units: the shoulder girdle, rib cage, and pelvis; these, together with the head, are arranged and supported by a

²⁰ Kempter, *How Muscles Learn*, 12-21.

²¹ Medoff, "The Importance of Movement Education," 210-19.

central axis, the spinal column. The weight of the upper body is transferred to the spine, from there to the pelvis, and then to the legs. This means that the weight transfer is cumulative, and the position of the pelvis plays a significant role in allowing minimal muscular effort to maintain an upright stance, or well balanced posture. Medoff notes that most people adopt either a posture that is too strained (having too much tension) or too slouched (not enough tension), and they tend to oscillate between the two. Neither of these options is desirable, or efficient. The balanced alignment according to Medoff comprises the following points:

Sitting Posture

1. The pelvis is vertical and balanced on the center of the two rounded bones at its bottom. It is neither tilted forward (causing the lower back to sway) nor tilted back.
2. The lumbar curve assumes a forward curve.
3. The ribcage hangs down toward the pelvis.
4. The shoulder girdle rests on top of the ribcage and the shoulders are relaxed; the chest floats up and the upper body widens.
5. To position the head properly, the spinal column lengthens upward through the center of the neck as the head floats up to balance on top of it.

Standing Posture

1. The feet are placed directly under the thigh sockets with the toes facing approximately straight ahead.
2. The knees are relaxed and in line with the thigh and ankle joints.
3. The pelvis rests on top of the thighs and is neither pushed forward nor tilted back.
4. The trunk is balanced as in the sitting posture.
5. The arms hang along at the sides.

Medoff proposes that since correct posture plays an extremely important role in accomplishing a successful career and preventing injury, it is necessary to incorporate into a violin teaching curriculum a special physical exercise system, labeled movement training, to teach students how to develop and maintain proper alignment.

Yoga as a Solution to Postural Problems

As may be easily observed, many authors reiterate the importance of good posture for musicians and point out the necessity of special care for the body that includes a system of exercises. So what is the ultimate solution? Hunter J.H. Fry believes that the Alexander Technique, Feldencreis Method, and Yoga develop healthy posture by promoting body awareness.²² Yoga practice offers a highly effective answer to the search for ways to allow musicians to stay healthy and to help with existing problems (injuries). It provides a method of obtaining optimally aligned posture by cultivating the body awareness necessary for correcting faulty positions while practicing or performing, and also of training the body to achieve appropriate muscle balance and necessary flexibility and strength. A national survey released in 2009 found that nearly sixteen million Americans currently practice Yoga.²³ This constantly growing interest in the discipline of Yoga has led to the intensification of medical research intended to evaluate its benefits.

²² Fry, "Overuse Syndrome in Musicians," 728 – 31.

²³"Yoga for Anxiety and Depression." *Harvard Mental Health Letter*, 4.

Yoga, the ancient discipline of mind, body, and spirit, has mostly been used by its Western adapters for its effects on health. A review of literature generated by scientifically conducted research shows that the Yoga effects on posture generate great interest and have promising results. For example, Greendale et al. in their pilot study assessed the effects of Yoga on twenty-one seventy-year-old women suffering from hyperkyphosis, otherwise known as “dowager’s hump.” As a result of their examination, the authors found that Yoga could be an optimal intervention for treating this illness. Not only did it improve physical and emotional functioning, but Yoga also tackled some of the underlying muscular and biomechanical causes of this ailment. This pilot study suggests that the use of Yoga for hyperkyphosis patients is safe, produces better posture by improving strength and flexibility (attested by improvements in physical function measures), and elicits greater awareness of alignment (indicated by women’s journal entries).²⁴ Another more recent study performed by P. Tekur et al. compared the effects of Yoga with traditional physical exercises. The randomized control study involved a group of eighty people diagnosed with chronic low back pain. The objective of this investigation was to compare the effects on pain and spinal flexibility in those subjects after one week of an intensive residential Yoga program (including *asanas*, *pranayama*, and meditation) with one week of a traditional physical exercise program. The results of the study showed that the intensive Yoga program was more effective than regular exercises. These conclusions were based on assessments by the Oswestry Disability Index and measurements of spinal flexibility. In comparison to the control group, the

²⁴Greendale, McDivit, Carpenter, Seeger and Huang, *Yoga for Women with Hyperkyphosis*, 1611-14.

Yoga group showed greater reduction of ODI scores and higher levels of spinal flexibility, specifically, much greater improvements in spinal flexion, extension, and right and left lateral flexion.²⁵ As illustrated above, Yoga presents itself as a valuable method of approaching the correct posture issue.

In her *Musician's Yoga*, Mia Olson, a professor of flute at Berklee College of Music and professional Kripalu Yoga Teacher, states:

In order to build a strong body for your instrument, it is necessary to start with building your foundation, which is good posture and proper body alignment. Each instrument presents its own set of physical challenges. In Yoga we practice paying close attention to how we carry our bodies and how we feel. The awareness you develop practicing Yoga techniques will carry over to how you practice your instrument Many musicians tend to round the shoulders, hunch the back, or lift one shoulder, creating a curve in the spine when they play If you are aware of being in these positions, you can counteract them by . . . practicing exercises to teach the spine another way of being.²⁶

Furthermore, Olson notes that Yoga teaches that shifting the posture has the ability to affect mood and the quality of tone produced. To counteract the tendency to round the back while playing the instrument, she recommends the *Yoga Mudra* exercise. *Yoga Mudra* is done by clasping the hands behind the back. It is important to oppose the tendency to lift the shoulders. Instead, the shoulder blades are pulled down the back, and the arms are lifted slightly up and away, which will open the front of the body. This pose

²⁵ Tekur et al., *Effect of Short-Term Intensive Yoga Program on Pain, Functional Disability, and Spinal Flexibility in Chronic Low Back Pain*, 637–44.

²⁶ Olson, *Musician's Yoga*, 41.

relieves tension from the upper arms and shoulders and stretches the back, counteracting the usual forward bending of the spine. See Figure 2.3.

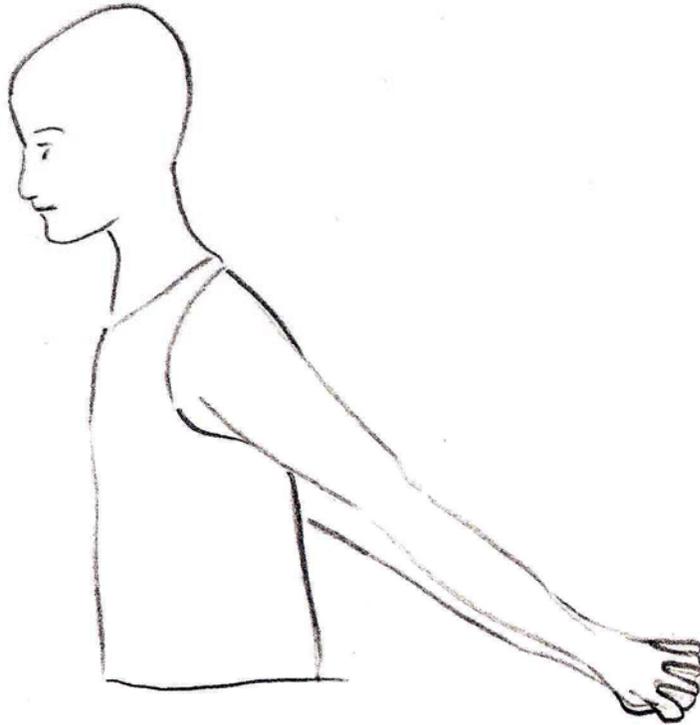


Figure 2.3. *Yoga Mudra* exercise.

For healthy posture, Olson also suggests one of the other fundamental Yoga poses, *Tadasana* (the Mountain Pose). See Figure 2. 4. This pose, or *asana*, is done by coming into a standing position with the feet parallel, hip width apart, and pointing straight ahead. Olson recommends lifting and spreading the toes wide apart and then relaxing the grip of the toes. The feet need to be spread out; Olson suggests imagining that the entire bottom of each foot is in contact with the floor beneath. After shifting the weight slightly forward and back, and side to side, the center is easier to locate.

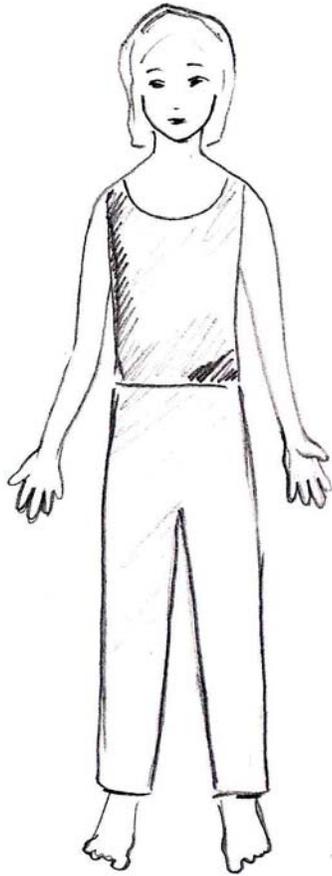


Figure 2.4. *Tadasana*.

The practitioner should find a still point where he or she feels balanced and centered. The knees need to be slightly bent in order to engage the muscles of the legs. It is essential never to lock any of the joints. Olsen suggests tucking the tailbone slightly in while somewhat engaging the muscles of the abdomen. The alignment continues by drawing the shoulders back and down, which will lift the chest slightly. To get the right feeling of this motion and consequently open the shoulders and the chest, Olson advises letting the arms fall down the sides of the body and then rotating the palms out so that

they face forward. After that, one should lift from the crown of the head, keeping the chin parallel to the floor and the ears aligned with the shoulders. To help elongate the spine, Olson suggests visualizing a helium balloon or a string attached to the crown of the head, creating length in the spine and space between each vertebra. There is an opposition of forces—grounding through the bottoms of the feet and lifting through the crown of the head. As all the points of the alignment are followed, softness is introduced into the posture. Practitioners should be conscious of trying too hard and, if so, should back away slightly. It is important to have a feeling of being in alignment while also possessing the ability to move and flow freely without stiffness or rigidity. The practitioner should stand in this posture for several breaths. Once comfortable with this alignment Olson advises walking slowly with this posture while breathing the full diaphragmic breath. Another way to consider proper alignment in this pose is to ensure that the knees are in alignment with the ankles, the hips with the knees, the shoulders are stacked above the hips, and the ears stacked above the shoulders. In addition, Olson explains that through the practice of this pose, one learns a natural, healthy position for the spine. Such a position allows room for breath, which in turn affects blood circulation. It is important to keep the blood flow because it helps to prevent overtiring and ultimately injury by removing the toxins from the muscles and bringing in nutrients.

Eleanor Winding is also interested in Yoga's effects on musicianship and has authored a Yoga practice manual devoted especially to musicians, *Yoga for Musicians and Other Special People*. Winding states that as one becomes a Yoga practitioner, the ability

to distinguish real needs of the body from habitual indulgences is gradually developed.²⁷ Winding stresses that *asanas* are always synchronized with the breath and are practiced to the point of strain, but never beyond. This is why Yoga is invigorating and never leaves one depleted of energy. Another aspect which Winding, as Olsen, emphasizes as a particular benefit of Yoga practice is its positive effect on blood circulation in the entire body. She explains that the blood releases its carbon dioxide formed from the wastes of metabolism and delivers a new supply of oxygen to every cell. If circulation is limited, the muscles and tendons become strained and potential for injury is increased. Winding proposes five general poses that invigorate the entire body, improve the general posture, and counter the effects of practicing the instrument for long hours. She believes that following *asanas* energizes the organism by deep breathing and serve as a gentle warm-up as well as strengthening procedure of the spine by bending it in all directions. It is important to note that some of these poses are demanding and experience in Yoga may be necessary to execute them exactly as Winding suggests; long retentions of the breath as well as prolonged inhalations and exhalations may be especially challenging for a beginner. In such cases, respect the body, move only as far as comfortable, and reduce the counts for breathing.

1. *The Oxygen Cocktail*

- a. Stand comfortably; exhale completely, emptying the lungs.
- b. Inhale through the nose. Feel the abdomen pushing out.

²⁷ Winding, *Yoga for Musicians and Other Special People*, 1.

- c. Bring the air up through the lungs, expanding the chest and stretching arms overhead. Rise up on toes and hold to the count of 10.
- d. Slowly lower the arms and feet while exhaling slowly. Repeat at least 3 times.²⁸ See Figure 2.5.

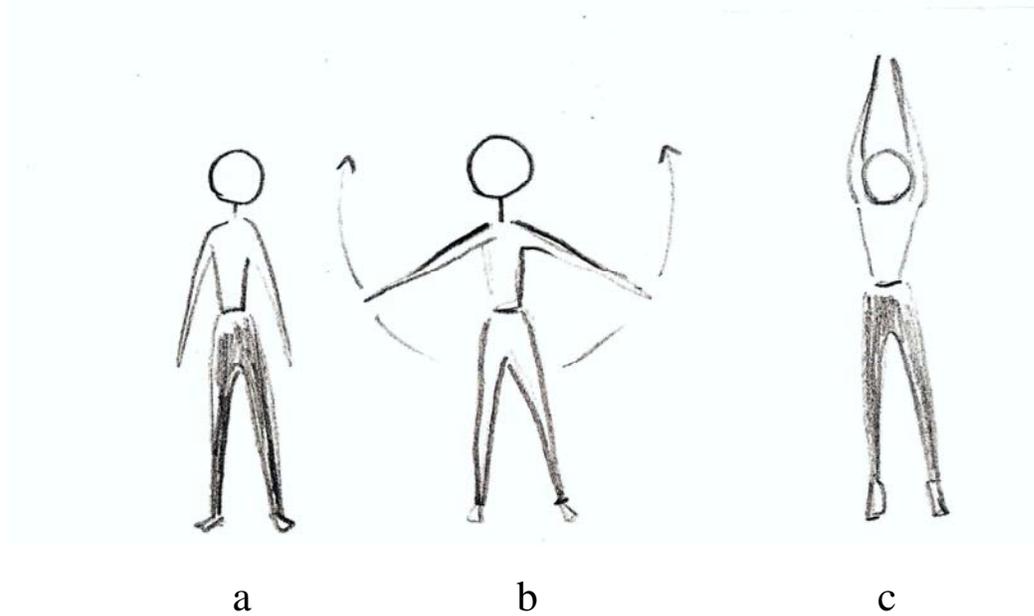


Figure 2.5. *Oxygen Cocktail*.

Winding calls this pose a quick energizer and it can be done before playing or during breaks, with or without lifting the arms. It vitalizes the brain, purifies the blood and strengthens the lungs.

2. *Push-Pulls*

- a. Stand straight and at ease, the feet slightly separated.

²⁸ Winding, *Yoga for Musicians and Other Special People*, 8-9.

- b. Grasp hands behind the back and press the shoulder blades together. Inhale. Keep head back, the chin up. Slowly bend backwards while pushing downward with the hands. Hold to a slow count of 10.
- c. Bend forward while exhaling completely, and pull the clasped hands and arms overhead. Hold to count of 15.
- d. Return to a standing position and relax.

This pose energizes the shoulder area, and generally relieves tension.²⁹ See Figure 2.6.

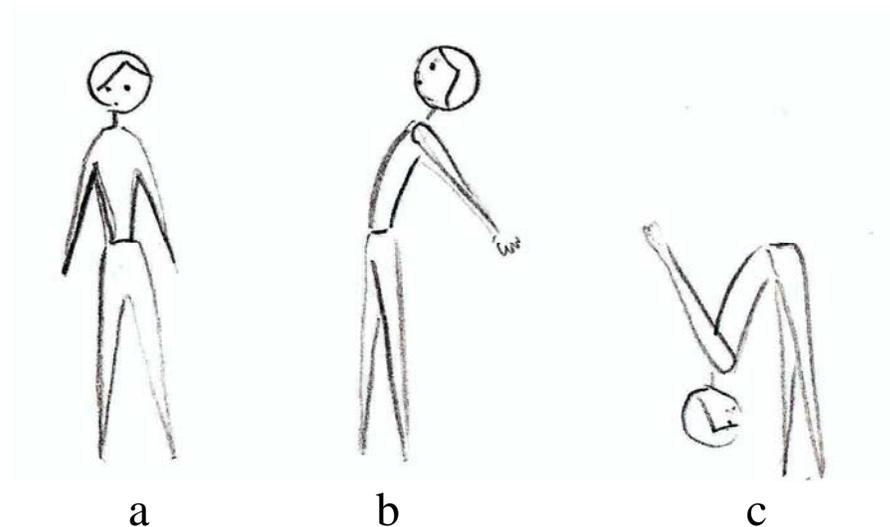


Figure 2.6. *Push-Pulls*.

3. *Standing Twist*

- a. Stand straight with feet slightly separated.
- b. Slowly twist the upper body, arms and head as far as possible with hips and pelvis remaining forward. Hold to a count of 10 and reverse – hold to a count of 10.

²⁹ Winding, *Yoga for Musicians and Other Special People*, 10-11.

- c. Return to front position. Repeat again, attempting to rise on toes and maintain balance through the entire movement.³⁰ See Figure 2.7.

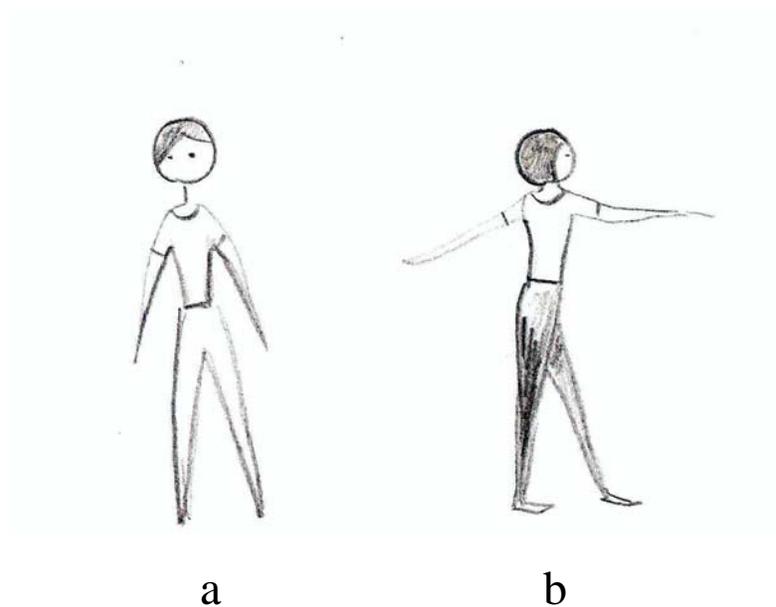


Figure 2.7. *Standing Twist*.

4. *Side Stretch*

- a. Still standing —arms at sides, palms up. Inhale completely at the count of 8, while raising arms overhead.
- b. Keep knees straight and very slowly bend to the side. Retain breath and hold to the count of 8.
- c. Bend to the opposite side — hold to 8.
- d. Reverse palms, lower arms, exhaling to the count of 16.³¹ See Figure 2.8.

³⁰ Winding, *Yoga for Musicians and Other Special People*, 11.

³¹ Winding, *Yoga for Musicians and Other Special People*, 12.

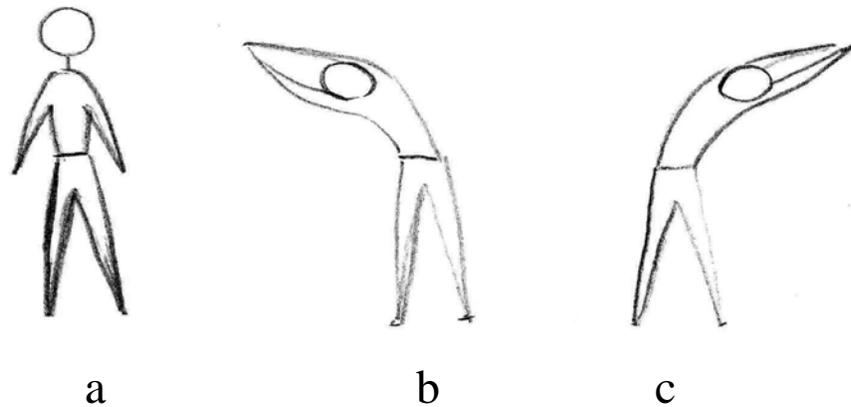


Figure 2.8. *Side Stretch*.

Winding notes that this pose provides a side bend, which is seldom done in daily activity.

The pose adds flexibility to the spine and firmness to the sides of the body.

5. *Head Rolls*

- a. Sit or stand with back straight and drop head forward.
- b. Visualize that your head is very heavy. Inhale and slowly roll your head to the right with your ear over the shoulder.
- c. Slowly roll your very heavy head all the way back, so the chin forward or up in the air and the crown of the head is down and back. Continue doing it over the left shoulder and on to the forward and dropped position. Exhale completely and then reverse the exercise. Repeat several times.

This *asana* loosens tensed muscles in the neck area, relieves stiffness, and often reduces headaches.³²

Robert Boustany is a renowned Yoga master who has been teaching *Astanga* and Power Yoga for over thirty years. He has worked on posture problems with a variety of students, including professional athletes as well as musicians. In an interview with Mr. Boustany on December 23, 2009, I questioned him about his recommendations and

³² Winding, *Yoga for Musicians and Other Special People*, 13.

observations concerning good posture for musicians, and especially violin players. He commented that he has been working on related posture issues. For learning the optimal standing position as prescribed by Olsen, Boustany recommends the practice of the Mountain Pose (*Tadasana*). His approach to this pose is somewhat different; Boustany believes that when in this pose one needs to slightly press the upper thighs back. This small correction allows the spine to find its most natural position, to lengthen and relax. In my opinion, this is an effective and highly original way to consider the “pelvic tilt” problem. As one may note after reading the portions of this chapter above, various sources either suggest the application of either pelvic tilt or tucking the pelvis in, which seems contradictory (pelvic tilt enhances the lumbar curve and a tucked-in pelvis neutralizes it). I have observed that it is best if the individual decides which procedure is most beneficial, depending on body type; in general, women do not need to enhance the lumbar curve, but men find it helpful. When one thinks about this dilemma from the perspective of simply pressing the upper thighs back, the pelvis may tilt slightly if there is a need for it to correct lordosis, or an exaggerated curve in the lumbar spine. If, on the other hand, one struggles with the flatness of the lower back, concentrating on this direction with help to do the opposite, that is, bringing back the natural curve of the spine. As one may observe, this recommendation is helpful in all cases.

Boustany noted that one needs to concentrate on this suggestion while allowing the lower back, abdomen, and neck to relax. This in turn will cause the quadriceps to work harder—one may notice stronger contraction in these muscles. Furthermore, for standing posture, Boustany recommends shifting the weight of the body slightly towards

the back of the feet (heels). This will additionally assist in lengthening the front or anterior part of the spine. Boustany explains that balanced posture exerts minimum pressure over the spine, and does not engage muscular or nerve effort. Such position will result in greater muscular strength and responsiveness, and this is something musicians definitely are interested in while searching for the most effective playing technique.

Boustany noted that these corrections also will result in releasing emotional stress. In sitting position, the Yoga master suggests sitting on the sit-bones, near the front of the chair. Then one will follow with balancing the head, chest, back, abdomen, and separating the shoulder blades. Widening or separating the shoulder blades will release the pressure from the neck. Also, one needs to note that doing so may cause the collar bone to move slightly forward. These adjustments assure the release of the pressure from the nerve supply to the arms and free the movements of the ribs in the upper ribcage, allowing greater ease while breathing.

Boustany also recommends practicing the Handstand pose (*Adho Mukha Vrksasana*) as another approach to working on improving general body posture. See Figure 4.10. This *asana* is advanced and challenging, so caution while attempting to perform it is advised. Boustany suggests executing Handstand close to the wall. The index fingers need to be parallel to each other, and the tips of the middle fingers should lightly touch the wall. This method of working on posture also allows the spine to release and improves the circulation throughout the entire body. Yet another way of dealing with the correct posture issue involves the strengthening of the core muscles that

support our upright position and prevent compression of the spine and internal organs: abdominal muscles (rectus abdominis, transversus abdominis), internal and external oblique muscles, as well as deep muscles such as sacrospinalis. Boustany proposes the lying *Tadasana* pose to work on these muscles. To achieve this pose, lie on the back with the knees bent while the feet are resting on the floor. See Figure 2.9 a.

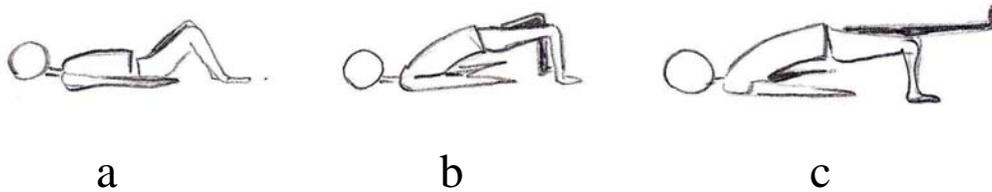


Figure 2.9. Lying *Tadasana*.

Then lift the hips while rotating the thighs in. See Figure 2.10 b. The final step is to lift one foot up, which will engage the abdominal muscles. See Figure 2.10 c.

Boustany believes that the importance of rest can not be overemphasized. Musicians usually are overworked and they do not allow their bodies enough time off to recover after long hours of practicing or rehearsing.

My Experience and Suggestions

In my own experience, despite many hours of practice sessions, attending music festivals with strenuous workload (National Repertory Orchestra, Roundtop Festival, Verbier Music Festival, etc.), and as a student not only rehearsing with university music ensembles but also various local groups and symphonies, I have never suffered a playing-related injury. I believe that the fact that I have practiced Yoga for over ten years is one of the main reasons, or perhaps the sole reason, for my injury-free experience. I have participated in various Yoga classes, not only in the United States but also in Poland (Iyengar Yoga Studio) and Switzerland. For one year I took part in Robert Boustany's Yoga Teacher's Training and during that time I extensively studied and practiced Power and *Ashtanga* Yoga. This allows me to proceed with my suggestions regarding healthy posture, aiming to complement the suggestions described up to this point and drawing from my personal practice and experience as well as sources mentioned above.

The information in the following paragraph will describe and illustrate several poses that I find beneficial as a general warm-up routine, compensating for the stress resulting from playing the violin. These exercises bring the best effects if done in the morning before practicing the instrument, but are also beneficial later during the evening.

Warm-up No. 1

To begin, lie down on the back with the knees bent; the feet are resting on the floor and the arms are comfortably placed slightly away from the body. Gently bring the

legs to the left until they reach the floor. See Figure 2.10a. While inhaling deeply, twist the body to the left by lifting the right shoulder and placing it directly over the left shoulder, or even slightly more towards the floor. See Figure 2.10b. During exhalation, return the upper body to the original relaxed position on the floor.

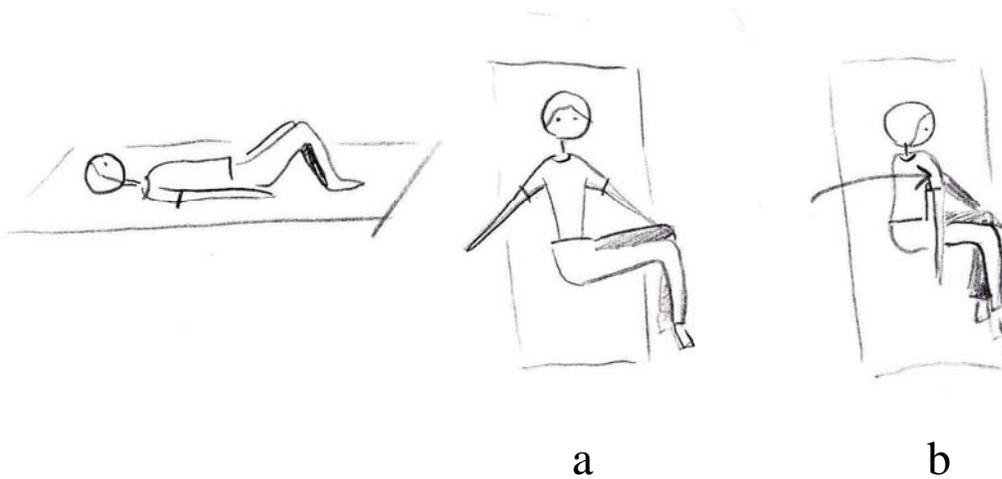


Figure 2.10. *Warm-up No. 1.*

Repeat at least three times, and then follow with the other side. This exercise should feel easy, as it is simply warming up the body. Follow the rhythm of the breath. This pose provides an opportunity to stretch and relax, specifically, the upper and middle back. To enhance the sense of stretching and invigoration of the body, follow with the *Warm up No.2* (an extended stretch).

Warm-up No. 2

While still lying on the back, extend the legs and place them on the floor. See Figure 2.11a. During the inhalation, twist to the left, again by bringing the right shoulder above the left shoulder, but this time also extend the right arm. See Figure 2.11 b. As you do so, also extend the right leg towards the right side of the body (opposite direction) creating opposition of forces. See Figure 2.11 b. While exhaling, bring the right elbow and knee in close to each other. Repeat three times and follow with the other side.

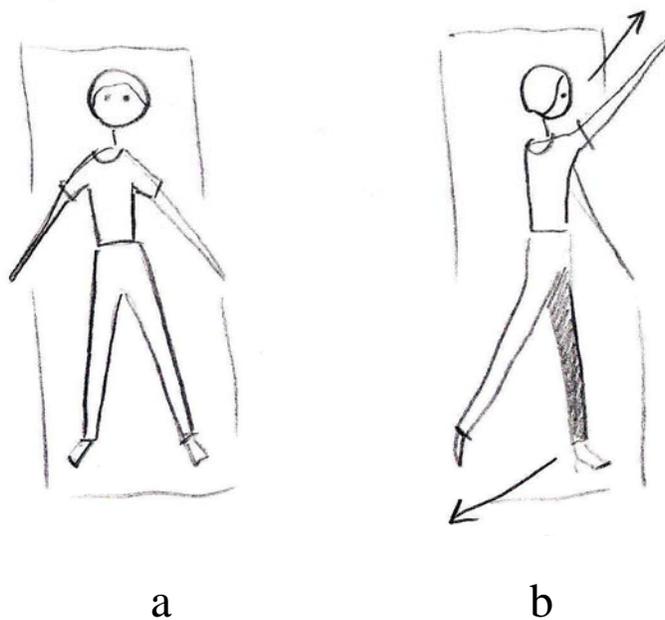


Figure 2.11. *Warm-up No. 2*

Next, I will continue with *Supta Padangusthasana*, or the Sleeping Big Toe pose. To realize this pose, continue lying on the back. While inhaling, raise the right leg and grab the big toe with two fingers and the thumb of the right hand; if it is too taxing to

reach the toe, hold the leg at any place that can be reached comfortably, or use a strap. In all options, try to bring the leg as close as comfortably possible towards the torso. Hold for five deep breaths. While exhaling, open the hips by lowering the right leg toward the floor to the right. Continue to hold the leg as before, keeping it straight, or bend the right leg and hold the knee as the body opens to the right. Remain there for five deep breaths. Repeat the same process on the left side. See Figure 2.12.

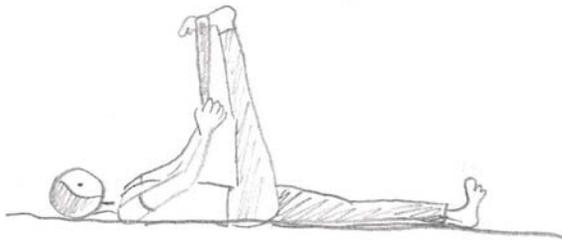


Figure 2.12. *Supta Padangusthasana*.

This pose aids in proper development of the legs. The blood is forced to circulate through the legs and hips where the nerves are rejuvenated. This is important for violinists and other musicians since they tend either to sit or stand for many hours, and the circulation in the legs is limited. This pose is also beneficial for both the prevention and treatment of sciatica and it removes stiffness in the hip joints. To continue the warm-up, keep lying on the back and grasp the knees. Start rocking back and forth on the back. This exercise

slightly massages the whole spine and helps to invigorate the body. From this point, I usually carry on with Sun Salutation (*Surya Namaskara*), a foundation of *Ashtanga* Yoga style, as it includes flowing links between every pose. This set of *asanas* establishes the mood and rhythm for the entire session of Yoga. According to David Swenson, the whole tradition of *Ashtanga* Yoga is an extension and refinement of the movements learned in Salutations. This set extends the warm-up, and also cultivates balance and strength of the whole body. Even when my time for Yoga practice is limited, I include a few of Sun Salutations. This is how David Swenson advises to perform this sequence:

Samasthiti: Stand with both feet together. Legs active. Spine long. Breathe deep. ONE: Inhale raising both arms. The lungs should be full just as the hands touch. Gaze at the thumbs. TWO: Exhale fold forward taking the chest toward the knees as you look towards the toes. THREE: Inhale lengthen the spine as you take your gaze to the horizon. FOUR: Exhale step or jump back. Lower down while gazing straight ahead. You may take your knees down first or come directly to the floor. FIVE: Inhale straighten the arms and roll onto the tops of the feet. Knees lifted. Toes pointed. SIX: Exhale as you push the hips up. Lengthen the spine from your sacrum through the top of your head. Press the heels toward the floor and lift the kneecaps. Gaze at your navel. Remain here for 5 deep breaths. SEVEN: Inhale as you either jump or walk the feet forward. Lengthen the spine and take your gaze to the horizon. EIGHT: Exhale fold forward taking the chest toward the knees as you look towards the toes. NINE: Inhale raising both arms high over the head until palms touch. Gaze at the thumbs. Samasthiti: Exhale.³³

See Figure 2.13.

³³ David Swenson, *Ashtanga Yoga*, 17

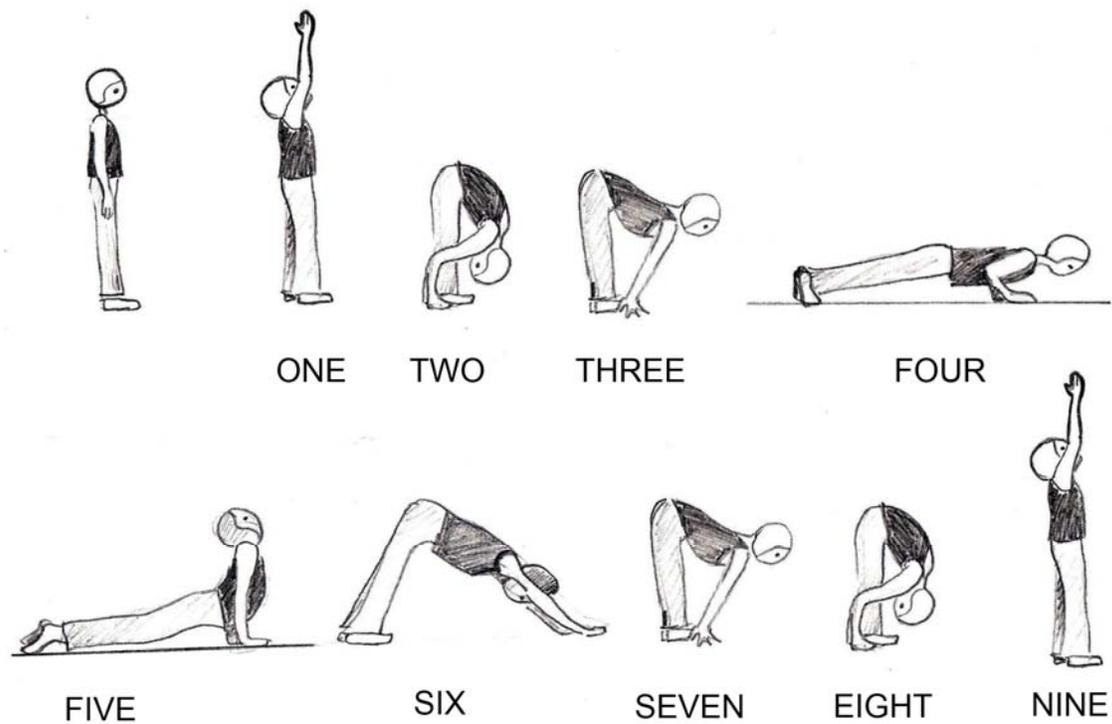


Figure 2.13. Adapted from David Swenson, *Ashtanga Yoga*, 17. Description of the Sun Salutation; each step is either a full *asana* or an intermediate position (link): for example, step two is *Padahasthasana*, step four Lower *Chaturanga Dandasana*; step five *Udrhva Mukha Svanasana*; and step six *Adho Mukha Svanasana*.

The poses and exercises suggested above address posture in general and aim to prepare the body for more specific poses, which will be discussed in following chapters. Also see the Appendix.

CHAPTER 3

SHOULDERS AND NECK

Introduction and Description of the Shoulder Joint

The majority of physiological problems for upper string musicians stem from the shoulders. Marjorie Moore's study deems the shoulders and neck the most common sites of pain.³⁴ While 70% of interviewed violin and viola players admitted to suffering pain somewhere in the upper limb, 50% of them experienced pain in the left shoulder and 30% in the right shoulder.³⁵ To fully understand the reasons for shoulder injuries and the means of prevention, it is important for musicians to understand the anatomy of the shoulder.

Among documents consulted, Paull and Harrison provide the most comprehensive description of the anatomy of this joint.³⁶ The authors explain that the shoulder is best understood as a "ball and socket" joint. The ball is formed by the end of the arm bone (humerus) and the socket is created by a small bony curvature, high on the outer edge of the shoulder blade (scapula). A fibrous cuff (labrum) is attached around the edge of the

³⁴ Moore et al., "Clinical Assessment of Shoulder Impingement Factors in Violin and Viola Players," 157.

³⁵ The area of the body including the shoulder, arm, forearm and hand is often referred to in medical sources as an upper limb.

³⁶ Paull and Harrison, *The Athletic Musician*, 71-81.

socket, deepening it by about 70%. Still, the socket remains shallow and much smaller than the head of the humerus, allowing the hand to reach any part of the body and perform movements such as playing tennis or swimming free-style. The shoulder joint is enclosed in a capsule that is lubricated on the inside and possesses a large fold underneath the joint. This fold stretches when the arm is raised above the head. The capsule also includes ligaments and several small muscles collectively called rotator cuff muscles (supraspinatus, which is located above the bony “spine” of the scapula, infraspinatus, teres minor, and subscapularis) that wrap around the shoulder blade, inserting into the top of the humerus. Their function is to hold the ball of the arm bone against the socket and ensure its central position. Small rotator cuff muscles work in opposition to such powerful muscles as deltoids, biceps, and triceps, all of which pull the arm bone upward into the shoulder socket, counterbalancing gravity and the weight of the arm. See Figure 3.1 and 3.2.

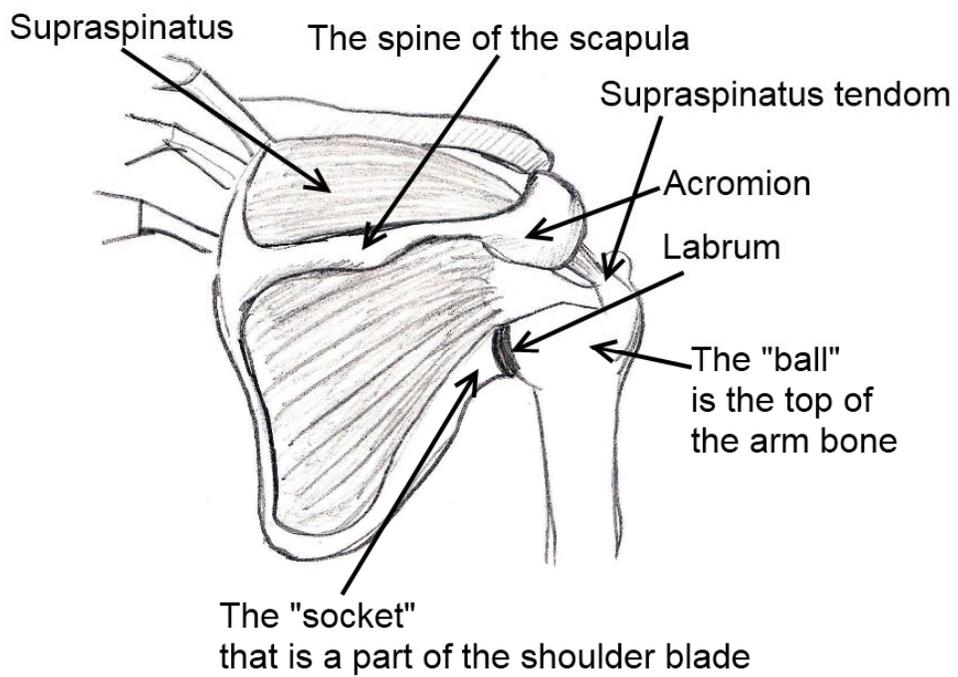


Figure 3.1. Shoulder joint. Adapted from Gudmestad, "Shoulder Saver," 113.

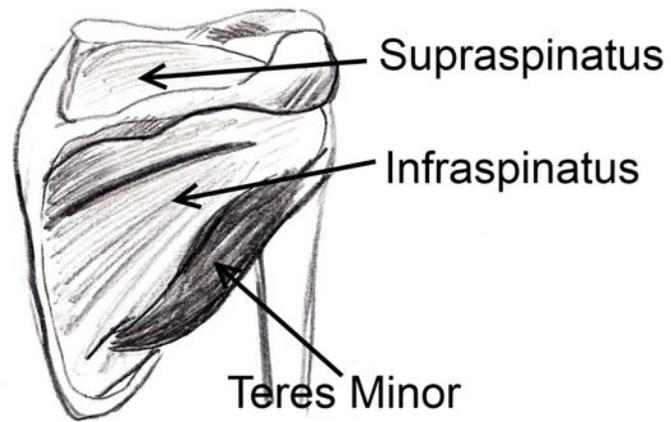
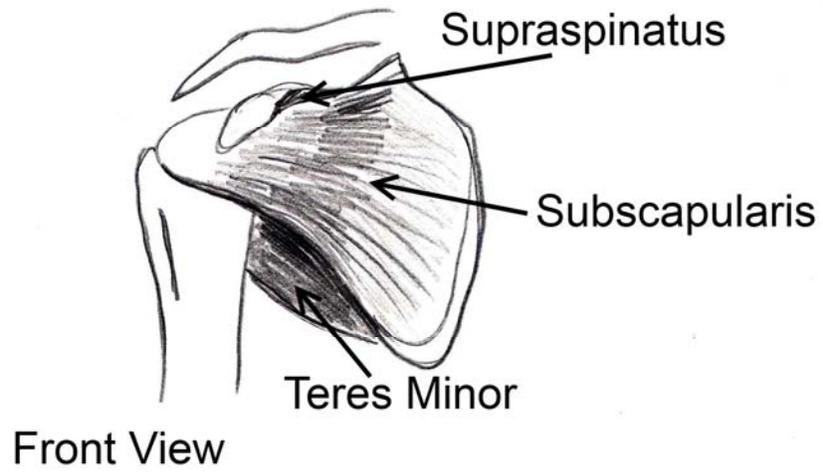


Figure 3.2. Rotator cuff.

Shoulder Injuries and Their Causes

Paull stresses that extensive playing a string instrument will inevitably lead to muscle imbalance. Holding the instrument and the arms in front of the body for many hours will result in the overdevelopment of the deltoids, triceps, biceps and even pectoral muscles. Rotator cuff muscles will not be able to withstand such power and will cease to work efficiently in opposition to these excessively strong muscles. Gradually, the head of the humerus will start to be positioned too high and too far forward. Infraspinatus and teres minor (two of the rotator cuff muscles responsible for holding the head of the humerus in place) will become overstretched, weakened, and ineffective. Paull emphasizes that this situation is caused by playing long hours and not by poor technique or excessive tension.³⁷ Obviously, it is essential to take care of the body, to exercise and counter the pressure exerted upon musculoskeletal system by playing. Otherwise, this muscle imbalance will destabilize the shoulder joint, unavoidably leading to pain, and can be the initial culprit for most shoulder injuries such as shoulder impingement syndrome, rotator cuff tears, bursitis, etc.

There is also another important factor to consider when discussing shoulder problems, or in fact, the mechanics of playing an instrument and any other playing-related injuries. Richard A. Hoppman and Nicholas A. Patrone believe it is essential to

³⁷ Paull and Harrison, *The Athletic Musician*, 74.

take into account both dynamic and static loads on musculoskeletal systems.³⁸ Static load involves continuous muscle contractions and stress across a joint and its supporting structures. Dynamic load refers to the stress across a joint and its supporting structures resulting from movement, especially high-frequency and forceful movements. Holding and playing the violin or viola requires constant muscle contraction in the left shoulder as well as the neck for extended periods of time, and that is an example of static load (for further information on the neck, see below). The right shoulder is subjected to both dynamic and static loading. Interestingly, Moore's study showed that even though the left shoulder statistically caused more pain, the authors found more cases of near shoulder impingement syndrome and the actual shoulder impingement syndrome in the right shoulder. This can be explained by the fact that the bowing arm is subjected to both static and dynamic loads (it is mostly held in an abducted position—moving away from the middle—and it is performing more repetitive motions as well, and thus at higher risk of injury).

Four potential shoulder problems that most commonly trouble instrumentalists include shoulder impingement syndrome, subacromial and subdeltoid bursitis, bicipital tendonitis, and rotator cuff syndrome. It is important to realize that a shoulder injury may also cause pain in the arm, hand, and neck since the muscles that move the shoulders and the neck (trapezius, rotator cuff muscles, and deltoids) work together.³⁹

³⁸ Hoppmann and Patrone, "Musculoskeletal Problems in Instrumental Musicians," 81.

³⁹ Horvath, *Playing (less) Hurt*, 61.

Janet Horvath presents a thorough and clear overview of these potential shoulder injuries. According to Horvath, tendonitis of the shoulder muscles is the most common cause of shoulder pain. This injury may occur as a result of the repetitive use of the arm at or above the shoulder level. Reduced blood supply caused by these motions leads to inflammation and microscopic tissue tears, as well as calcium deposits. The condition of inflamed tendons is diagnosed as tendonitis. Bursae are fluid-filled sacks that allow for the smooth action of tendons and ligaments, facilitating efficiency of motion by reducing friction between ligaments and bones. Holding the arm overhead or away from the body for long periods of time contributes to squeezing the rotator cuff muscles and the bursae at the shoulder joint. Inflammation may occur as a result of it, leading to thickening of the bursa and may change its texture from smooth to fibrous. This condition is called bursitis and causes radiating pain down the upper arm as well as restriction of movement. Rotator cuff tears appear among musicians usually as the result of repetitive strain and previous tendonitis injuries. As rotator cuff muscles become thinned and weakened, the tendons will gradually rip (as Horvath notes, the possibility of this injury significantly increases if a person is physically inactive). This injury causes pain starting at the shoulder and continuing down the upper arm, weakness of the arm, and the inability to raise it. Shoulder impingement syndrome occurs when the tendon of one of the rotator cuff muscles (supraspinatus) is pinched. Supraspinatus, which lies above the ridge (spine) on the surface of the scapula, reaches across the top of the humerus before connecting to the arm bone towards the front. Supraspinatus muscle travels within a rigid tunnel created by the shoulder joint and acromion, and is protected by a bursa. When the

head of the arm bone moves too high in its socket (this occurs when the arm is lifted), the supraspinatus tendon is pinched against the acromion, about halfway through the movement. If the pinching repeats (and in the musician's case, this range of motion—the arm lifted about half-way—is where string players spend most of their time playing), the supraspinatus tendon becomes inflamed and swollen and the pain increases, reaching down the arm as far as the wrist.⁴⁰

Yoga and Shoulder

Many serious problems for instrumentalists, especially upper string musicians, occur in the shoulder joints. The practice of Yoga may be used as an effective method for dealing with challenges of shoulder injury prevention and treatment. The remainder of this chapter will investigate the following three articles that offer convincing evidence in support of this claim: “Shoulder Saver: How a Down Dog Each Day Keeps Painful Injuries at Bay,” by Julie Gudmestad,⁴¹ “Headstand for Rotator Cuff Tear: *Shirshasana* or Surgery,” by Loren M. Fishman et al.,⁴² and “Case Studies of Yoga Therapy with Focused Downward Release and Scapular Stabilization in Shoulder Injuries,” by Nicole DeAvilla.⁴³ I will also supplement this information with observations drawn from my own research and experience of Yoga practice.

⁴⁰ Paull and Harrison, *The Athletic Musician*, 74-77.

⁴¹ Gudmestad, “Shoulder Saver,” 113-15.

⁴² Fishman, Konnoth and Polesin, “Headstand for Rotator Cuff Tear,” 39-47.

⁴³ DeAvilla, “Case Studies of Yoga Therapy with Focused Downward Release and Scapular Stabilization in Shoulder Injuries,” 65-73.

A physical therapist and Iyengar Yoga instructor, Julie Gudmestad, in agreement with both Paull and Horvath, emphasizes that the rotator cuff muscles (subscapularis, teres minor, infraspinatus, and supraspinatus) are key to maintaining healthy shoulders. Gudmestad explains that teres minor and infraspinatus control the external rotation of the shoulder, and if they are not exercised properly, they eventually weaken, leading to impingement syndrome, tendonitis, or bursitis injuries. She also stresses that surgical intervention is not always efficient. Weakened and torn tissues of the muscle are extremely difficult to repair (sometimes even doctors compare this kind of surgery to attempts to sew up a run in a nylon stocking). Gudmestad proposes that teres minor and infraspinatus, as well as other rotator cuff muscles, are strengthened in *Adho Mukha Svanasana* (Downward Dog Pose). Proper execution of the Downward Dog can prove quite daunting. To understand the correct way of engaging the external rotators in Downward Dog, Gudmestad suggests trying it outside of the *asana*. She recommends standing facing a table or a desk, then leaning forward and placing the hands on it, palms down, bearing little weight. Then she advises looking at the elbows while noticing the crease on the inner sides and points of the elbows on the outer sides. The shoulders are externally rotating if the arms are rotated in such a way that the creases point forward. To achieve the proper action of external rotators takes some training. Many Yoga students slip (even while in Downward Dog) into internal rotation, which leaves teres minor and infraspinatus inactive. To remedy these problems, Gudmestad suggests oscillation between external and internal rotation, while practicing on the table with little

application of the weight. Gudmestad believes that it is possible to feel these muscles contract across the back of the shoulder blade during external rotation.⁴⁴

After learning to recognize the sensation of engaging the teres minor and infraspinatus, the next step is to practice the actual pose. Here is a summary of the steps to perform Downward Dog. Start by standing in Mountain Pose (for description of this *asana*, see Chapter 1 p. 25-26). See Figure 3.3.a. During exhalation, fold forward out of the hips, bending the knees slightly. Bring the palms down to the floor, place them next to the outer edges of the feet or slightly in front of them, and allow the knees to bend further if needed. See Figure 3.3.b. Bring one foot back first and then the other (Figure 3.3.c). Straighten the arms (the index fingers are parallel), push the hips up, and lengthen the spine from the sacrum through the top of the head. See Figure 3.4.

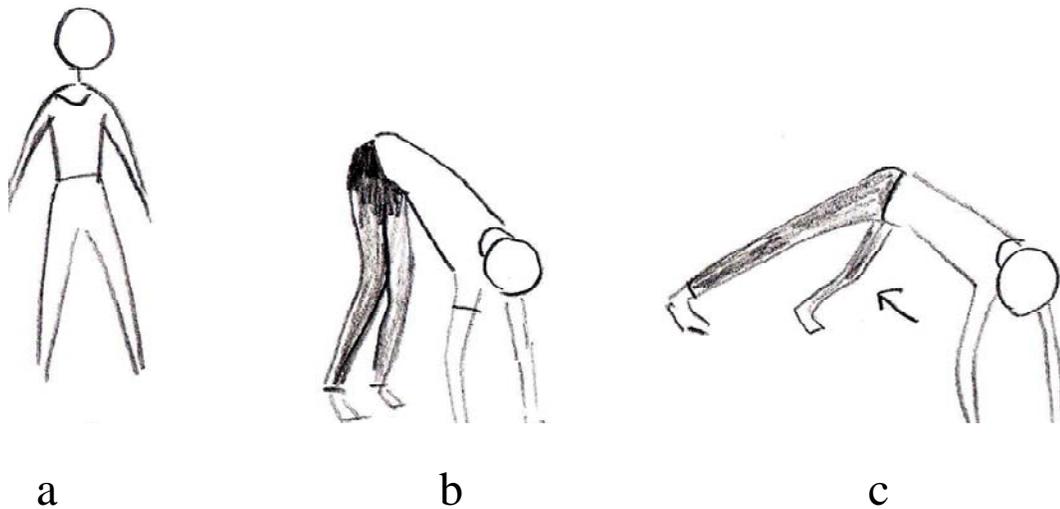


Figure 3.3. Steps of Downward Dog.

⁴⁴ Gudmestad, "Shoulder Saver," 114.

The body should form a triangle (see Figure 3.4).

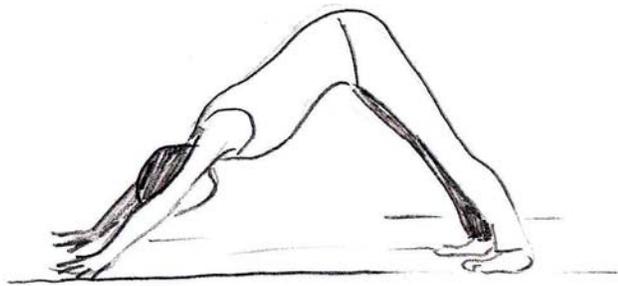


Figure 3.4. *Adho Mukha Svanasana* (Downward Dog Pose).

While in this position, breathe deeply, gaze at the navel, and slightly press down the knuckles of the index fingers and thumbs. The shoulder blades slide slightly down toward the tailbone and away from each other, widening the back and creating space around the neck. For very advanced practitioners who are able to perform the ultimate version of this pose, the head reaches the floor, the feet are placed also on the floor, and the legs remain straight. If this does not occur comfortably — and it will be the case for the majority of Yoga students — one needs to allow either the knees to bend slightly or work in the direction of reaching the floor with the heels (without them actually touching the floor) while keeping the legs straight. The crown of the head will remain off the floor, while the neck relaxes. After staying in this pose for about a minute and breathing deeply, rest in Child Pose (*Balāsana*). See Figure 3.5. Bring the knees to the floor, push the hips

back and sit lightly on your heels. Rest the forehead to the floor. To make this position more comfortable, one may allow the knees to move a little out or slightly raise the hips. Either stretch the arms in front of you with the palms toward the floor, or bring the arms back alongside the thighs with the palms facing upwards.

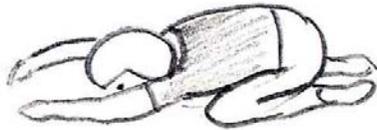


Figure 3.5. *Balasana*.

Gudmestad recommends coming slightly forward toward the Plank Pose (Higher *Chaturanga Dandasana*) while in Downward Dog; the forward movement will lead to a position where the hands are directly under shoulders, arms straight, the only contact points being the palms and toes, and the body is in horizontal alignment, thus in a Plank Pose. Then concentrate on rotating the elbow creases relatively forward (they need to point toward the thumbs). Afterwards, move again back into Downward Dog while keeping some of this external rotation. When maintained, it will keep *teres minor* and *infraspinatus* contracting. This action will also create more open space between the shoulder blades (the back will widen as also recommended by Alexander Technique instructors).⁴⁵

⁴⁵Gudmestad, "Shoulder Saver," 115.

Once keeping the external rotators engaged is mastered in Downward Dog, one may apply the same principles of motion in more challenging poses such as *Urdhva Mukha Svanasana* (Upward Facing Dog Pose) and Lower *Chaturanga Dandasana* (Four-Limbed Staff Pose). As more advanced practice routine, Gudmestad proposes to start again in Downward Dog and then assume the Higher Plank Pose, rotating the creases of the elbows forward and holding the elbows against the sides of the body. Then one would move into Lower *Chaturanga* and then Upward Dog. If the external rotators are working in these poses the chest will broaden and lift.

Gudmestad also points out that shoulder rotation during practice of the Downward and Upward Dog poses affects the weight distribution in the hands. Internal rotation causes the weight to fall more towards the inner side of the hand (thumbs and index fingers), while external rotation results in the weight moving more towards the outer edge of the hand. Ideally, the weight needs to be distributed evenly, so during the external rotation it is best to concentrate on actively pressing down upon the base of the index finger and thumb (this movement will cause pronation of the arm). Pronation of the arm most commonly occurs during internal rotation. Consequently, Downward and Upward Dog require an opposite action, which creates a break in the usual pattern. Gudmestad states that this is one of the many examples where Yoga practice helps to break old, unconscious habits and replaces them with more effective actions as a result of a new level of awareness.

Downward and Upward Dog, as well as Lower *Chaturanga Dandasana*, are all part of the *Sun Salutation* routine. See Chapter 2, Figure 2.13, steps 4-6 for a short

description of these poses. If practiced often (best if daily), these *asanas* truly make a difference in the level of shoulder awareness, and also act as a counterbalance to the natural tendency to lift the shoulders during emotional stress or fatigue caused by playing for too many hours. In my experience, after some time practicing these poses (both in *Sun Salutations* and separately), I realized that my ability to notice what is really happening in this area of my body grew substantially. For example, practicing Yoga in general, and these *asanas* specifically, allowed me to realize that my sense of discomfort and tension in the left hand was mostly caused, not by faulty positioning of my hand or faulty angle of my fingers, as I had always thought before, but simply by the accumulation of tension in my left shoulder. Now I am also much more aware of the point when the stress starts to creep into my shoulders and they lift up (especially during long rehearsals or practice sessions or when I am nervous before performing). Certain Yoga procedures and stretches can immediately help to relax and thus prevent further build up of tension. For more information see *Further Notes* and Appendix.

Another valid outlook on shoulder injuries and the effectiveness of Yoga in their treatment is presented in two *International Journal of Yoga Therapy* articles: “Headstand for Rotator Cuff Tear: *Shirshasana* or Surgery” by Loren M. Fishman et al., and “Case Studies of Yoga Therapy with Focused Downward Release and Scapular Stabilization in Shoulder Injuries” by Nicole DeAvilla. The authors of both studies stress that shoulder injuries can be complex and time consuming to rehabilitate. After surgery, the recovery may take up to eighteen weeks. Another standard treatment, physical therapy without surgery, usually involves immobilization of the arm (this is obviously a big problem for

musicians). The authors believe that Yoga is well-suited to address both the complexity and subtlety of shoulder rehabilitation, and proves to be equally or even more efficient than standard procedures, being free of the stresses of surgery and without the need for complete restriction of the injured area.

The Fishman study focuses specifically on rotator cuff syndrome, which most commonly refers to a tear of the supraspinatus tendon but may also indicate a tear in any of the other rotator cuff muscles.⁴⁶ This study is based on the author's own discovery of the highly beneficial effects of *Shirshasana* (Headstand) practice for rotator cuff syndrome. For about four weeks, Fishman was awaiting surgical consultation on her injury. During that time she noticed that the practice of Headstand seemed to relieve her pain, and eventually led to complete recovery from the injury as confirmed by further medical examinations, including MRI. This discovery inspired Fishman to perform a study that would research and explain the phenomenon she observed. The study involved ten patients with clinically diagnosed rotator cuff syndrome. The patients underwent a six weeks program that contained practice of either Headstand or its modified version (*Urdhva Dandasana*). The participants were directed to (see Figure 3.6):

1. Stand with your back to a chair.
2. Place your right shin on the seat of the chair.
3. Bend forward, placing your palms on the floor, fairly close to the chair.
4. Raise the left shin to the chair seat, so that you are now kneeling on the chair with your hands on the floor.

⁴⁶ Fishman, Konnoth, and Polesin, "Headstand for Rotator Cuff Tear," 39-47.

5. Bend your elbows as you lower your head to the floor. After your head is securely planted on the floor, center it between your hands. Be careful not to place your weight either on the forehead or the back of your head, but rather at the fontanelles, the spot that is soft in babies.
6. Make an equilateral triangle on the floor with the little finger side of your forearms by clasping your hands. Place the heels of your hands, not the palms, in contact with the back of your head.
7. At this point, with your weight chiefly on your head, widen and raise your shoulders further from the floor.⁴⁷

The positive effects of this method were unexpected by the author; the natural assumption would be that performing Headstand would only aggravate the condition. The findings are, however, explained by the anatomy of this injury. Rotator cuff syndrome is clinically identified by pain, while actively abducting (taking away from the middle of the body) and flexing (bending) the arm beyond 80 degrees. This occurs because at the point of 80 degrees of motion, the deltoid muscle is replaced by supraspinatus in the function of raising the arm. During the Fishman study, it had been observed that Headstand's helpfulness lies in the fact that it induces neuromuscular retraining and use of the subscapularis muscle instead of supraspinatus. Performing Headstands enabled the subconscious bypassing of injured parts of the rotator cuff (tendon of the supraspinatus) in both flexion and abduction of the arm, permitting the tendon to remain relaxed and heal.

⁴⁷ Fishman, Konnoth, and Polesin, "Headstand for Rotator Cuff Tear," 41.

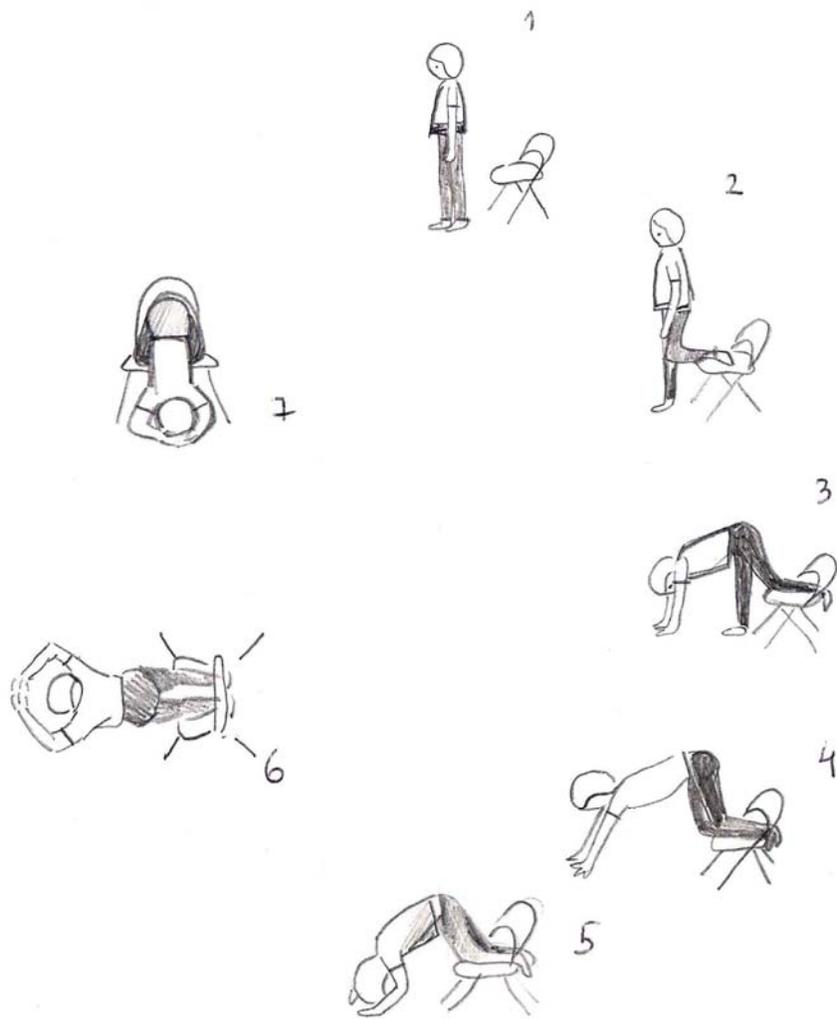


Figure 3.6. Steps of *Urdhva Dandasana* (Modified Headstand).

The patients learned to substitute the use of the deltoid and supraspinatus pair with newly acquired coordination of the deltoid with subscapularis. The effects were immediate; just after one thirty second Headstand, patients already could move their arm more freely and without pain.

Nicole DeAvila, a certified Yoga teacher, discusses in her article three case studies of patients with various shoulder injuries (including thoracic outlet syndrome, bicep tendonitis, and rotator cuff injury). The patients underwent a Yoga therapy program to aid their rehabilitation. In all cases the patients were advised to perform a set of Yoga poses while employing Focused Downward Release and Scapular Stabilization (FDRSS). The notion of FDRSS involves a release of ancillary (secondary) upper shoulder muscles (upper trapezius, levator scapulae, and supraspinatus); the engaging of scapular depression muscles (lower trapezius and lower serratus anterior) or, in other words, sliding the shoulder blades slightly down the back; and developing an awareness of the spine, including a sense of energy moving up, which creates a feeling of support and center. DeAvilla stresses that tension is usually the first reason for shoulder injuries as it leads to abnormal shoulder biomechanics and even muscle atrophy (lifting the shoulder is one of the most common harmful habits). DeAvilla notes the unique value of Yoga; many of the *asanas* not only work several muscles groups both for flexibility and strength simultaneously, but also teach the body to relax the muscles not being used. The Yoga treatment included Yoga poses such as *Shavasana* (Corpse Pose) with the focus on deep belly breathing, *Setu Bhandasana* (Bridge Pose) or its variation, inversions on the wall, and Downward Dog Pose at the wall (feet on the floor and palms placed on the wall

above the head). The Yoga teacher assisted the patients in understanding and achieving Focused Downward Release and Scapular Stabilization in all the poses. The learning process began with the least demanding poses (such as *Shavasana*) and progressed further as ease and proficiency was accomplished. This approach proved to be highly successful; all patients recovered from their injuries without need for surgery and were able to resume normal activities involving their shoulders.⁴⁸

Neck

As seen both in this and previous chapters, the shoulders and neck are closely related, oftentimes even referred to collectively as the upper body, or upper back area. In addition to what is already included in previous paragraphs, I would like to note the importance of the angle of the neck while holding the violin and propose the correct head position. As mentioned before, a bent neck is an example of static load. The neck muscles are engaged in a lifting task when the head is positioned forward, backward, or to either side (the average weight of the head is about fifteen pounds).⁴⁹ This means that if the head is not in its most neutral position (“floating on top of the neck” as taught by

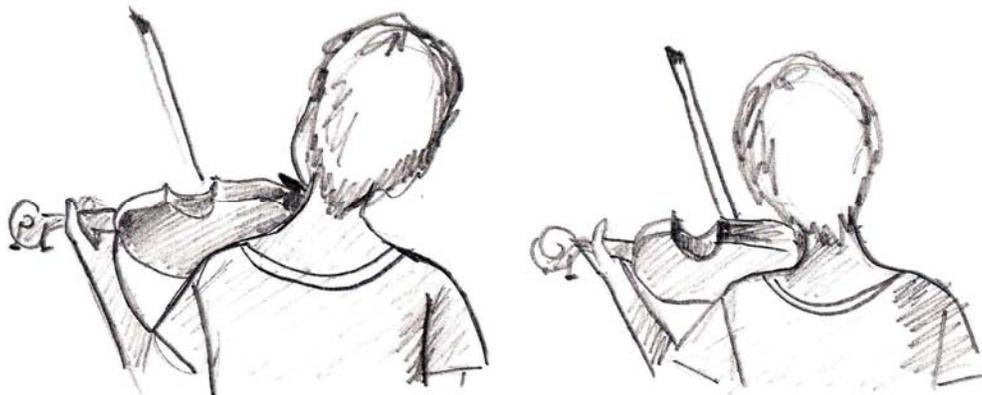
⁴⁸ DeAvila, “Case Studies of Yoga Therapy with Focused Downward Release and Scapular Stabilization in Shoulder Injuries,” 65-73.

⁴⁹ Horvath, *Playing (less) Hurt*, 50-51.

Alexander technique instructors, Yoga teachers, and medical doctors), the neck and upper shoulder muscles have to work on supporting it instead of just balancing it. If the arms are lifted in front of the body, the stress is exaggerated. Contracting neck and shoulder muscles for long periods of time obstructs the blood flow, and may compress surrounding nerves that run down the arm (for example median and ulnar nerves). This tension can result in disc or nerve problems, headaches, eye strain, and its effects can even be confused with injuries such as carpal tunnel syndrome because the pain travels down the median nerve.

The most natural head position while playing the violin involves the head slightly turned toward the instrument (imagining the nose pointing in the direction of the scroll), without either excessively lowering or raising the chin. The head is just resting on the violin without clasping it, and that way holding it in place. Finding such a position can be a challenge, especially for those with long necks and sloping shoulders. It may be necessary to experiment with different chinrests (for example, with their various heights and positioning either at the center or the side of the violin) and shoulderrests. The correct head position for violinists is excellently illustrated by Susan Kempter as shown in the next Figure.⁵⁰

⁵⁰ Kempter, *How Muscles Learn*, 24-25.



Incorrect angle.

Correct angle.

Figure 3.7. Correct head position for violinists. Adapted from Kempter, *How Muscles Learn*, 24.

Further Notes

In closing, I would like to discuss a selection of additional Yoga poses and stretches that I particularly find helpful for the shoulder and neck areas. I will start with exercises that do not require a lot of time and space, and can be done even during a rehearsal break.

1. *Shoulder Rolls*

Inhale, lift the right shoulder up (toward the ear) and move it slightly forward, then exhale and bring it down and slightly back; the shoulder is making a circle. As the right shoulder is moving up and forwards, the left shoulder is simultaneously moving down and back, also making circles. Complete a few such cycles breathing deeply. Then reverse: start again with lifting the right shoulder up and slightly forward, but as it moves

down keep bringing it forward instead of towards the back. As the right shoulder is moving down and forward, the left shoulder is traveling up and back. Repeat several times.

2. *Garudasana* (Eagle Pose Arms)

Inhale as you extend the arms out to the side in a “T” position; the palms are facing down. Exhale and cross the arms in front of you at the elbow joints, the left elbow or upper arm above the right. The palms are facing each other, fingers pointed to the sky. Stay for several breaths. Repeat on the other side. This position removes stiffness in the shoulders and stretches the area between the shoulder blades. See Figure 3.8.

3. *Gomukhasana* (Cow Face Pose Arms)

Raise the left arm over the head, bend it at the elbow, and place the left palm below the nape of the neck, drawing the hand towards the center of the back. Lower the right arm, bend it at the elbow, and raise the right forearm up behind the back; the right hand is attempting to reach the area between the shoulder blades. If possible, clasp the hands (if not possible, keep the arms where they are comfortable—hold on to the wrist or use the strap) and breathe deeply. With time, the range of the reach will increase. Repeat on the other side. See Figure 3.8.

EAGLE ARMS



COW FACE ARMS



Figure 3.8. Cow Face Arms and Eagle Arms.

Yet another wonderful way to quickly release tension from the shoulder area (especially the underarm region) is a stretch done on the wall.

4. “*Stretch on the wall*”

Stand close to the wall, facing it. Extend the right arm above the head and place the palm on the wall. Then lean towards the wall into the palm. Feel the body hanging from the palm; the muscles around the shoulder relax and stretch. Stay for several breaths. Repeat on the other side.

I have observed that poses such as *Padangusthasana* (Forward Bend with the hold of the toes) or *Uttanasana* (hands placed on the floor or anywhere on the legs) and *Utthita Trikonasana* (Extended Triangle), even though they may seem to address mainly the lower half of the body (hips and legs), surprisingly offer great release for the upper arms, shoulders, and neck. These poses require a little more attention and time to perform, so it may be more beneficial to practice them at home or in a Yoga class.

5. *Padangusthasana* (Forward Bend)

Stand in *Tadasana* (Mountain Pose), feet hip width apart. While exhalation place your hands on the waist and bend forward out of the hips. As you inhale, look up toward the sky and keep the shoulders back. Exhale and bend further down. If needed, bend the knees slightly and imagine the spine lengthening all the way from the tailbone to the top of the head. Either clasp the big toes with two fingers of each hand, or if this is uncomfortable, place the hands anywhere on the legs, avoiding any pain on the inside of the knees. With practice, this pose offers ever increasing release in the entire spine. I

have noticed that simply the weight of the head and upper body helps in lengthening the cervical and thoracic sections of the spine in the most natural way—by allowing gravity to work. See Figure 3.9. below:

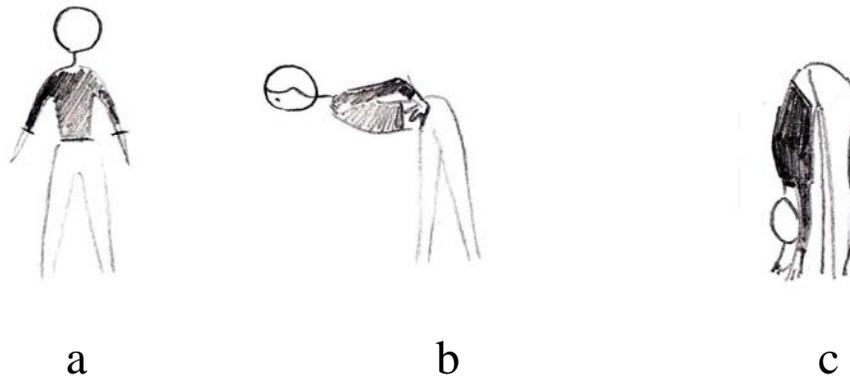


Figure 3.9. *Padangusthasana* (Forward Bend).

6. *Utthita Trikonasana* (Extended Triangle)

This pose is quite challenging, thus I will describe its variation. Stand in *Tadasana*, inhale, and step back with the left foot. The feet need to be about leg length (approximately three feet) apart. The right foot turns out 90 degrees; the left foot turns in about 45 degrees. Place the left hand on the waist and extend the right arm above the head. Exhale and bend sideways toward the right leg, keeping the lower back extended. The chest remains open, staying in line with the extended leg. Place the right hand anywhere on the right leg and extend the left arm above the head if desired. Look forward, or if it is comfortable, turn the head and gaze toward the sky. Soften the shoulders and remain in this position for five deep breaths. Repeat on the other side. I

have observed that this pose, besides the various benefits for legs and hips, results in the correction of the alignment in the neck. For the ultimate version of this pose, see Figure 3.10.

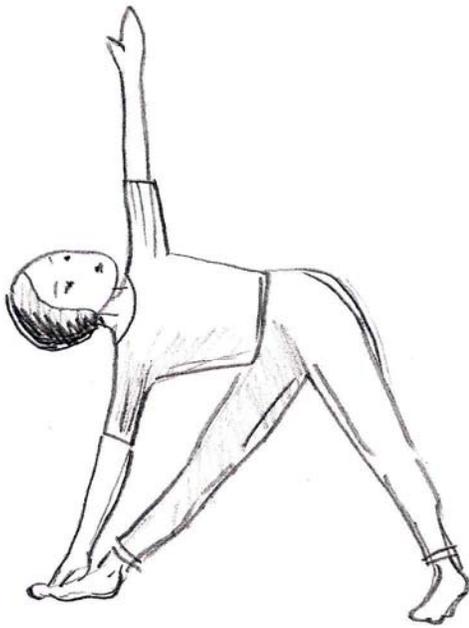


Figure 3.10. *Utthita Trikonasana*.

CHAPTER 4

HANDS, WRISTS, ARMS, AND ELBOWS

Introduction

Instrumental musicians constantly use their hands and arms in a variety of ways. In search of achieving optimum artistic goals, performers train the upper limb not only to execute a wide range of movements, but also to apply them with an array of force (from the most powerful to most subtle motions). The use of the hands, wrists, and arms also entails extensive repetitious movements. These high demands usually far exceed requirements of normal manual activity and dexterity and may force musicians to adopt positions without considering the physiological balance or biomechanics of the muscles and joints. The following chapter will discuss musicians' concerns related to this area of the body. It is important for performers to know the mechanics of how our "music making tools" work so that we may approach their natural demands with more sensitivity and respect, thus preventing injuries and promoting the most efficient playing technique. Since the anatomy of the upper limb is extremely complex and its detailed description would reach far beyond the scope of this paper, only issues that I find most significant for violinists will be addressed here. This will be followed by a discussion of the most common injuries that occur among upper string players and an investigation of ways in which Yoga practice can assist in confronting these challenges.

Anatomy of the Upper Limb

There are 39 muscles that allow for the complex, abundantly prevalent permutations of combined movements of the wrist and fingers.⁵¹ As mentioned in Chapter 2, the muscles on the opposite sides of the limb work as pairs. They are called antagonist muscles, and as one shortens, the other lengthens. It is also worth noting that movements, as opposed to partial motions of individual muscles, are perceived and controlled by the cerebral cortex. This may explain why it is easier and proves to be more successful to imagine or visualize a certain motion and then let the body execute it as opposed to striving to achieve the same goal by trying to direct particular muscles. Interestingly, most muscles responsible for movements of the hand are primarily located in the forearm (extrinsic muscles). This allows the hand to stay relatively light and slim, and enhances its dexterity and precision of the movement. The muscles located in the hand itself (intrinsic muscles) are responsible for fine, coordinated movements that do not demand use of great force. The closing and opening of the fingers (flexion and extension) are controlled by extrinsic muscles. It is important to note that the thumb and little finger share a muscle and thus closely influence each other.

As mentioned earlier, the skeleton of the upper limb consists of the shoulder joint, arm bone (humerus), elbow joint, forearm (comprised of 2 bones, the radius and ulna), wrist joint, and hand. The shoulder was already discussed in the previous chapter. The elbow joint is the next joint of the upper limb; it connects the humerus with the radius

⁵¹ Tubiana and Chamagne, “Functional Anatomy of the Hand,” 183-186.

and ulna bones. It is a hinge joint moving only in one plane, and it either extends (opens) or flexes (closes) the arm. The wrist is the most complex joint of this area as it actually comprises of a series of joints. This complexity allows a variety of hand movements: flexion (bringing the hand toward the under side of the forearm), extension (rising of the hand), ulnar deviation (angling toward the little finger side of the hand), radial deviation (angling toward the thumb side of the hand), supination, and pronation. The skeleton of the hand consists of nineteen bones and seventeen joints. The finger bones (phalanges) and hand bones (metacarpals) differ in length and number of segments, allowing for the most mobility. Additionally, the skeleton of the hand includes a number of fibrous arches that run both across and lengthwise down the palm, creating tunnels that are crossed by the finger flexor tendons and nerves. These arches contribute to the cup shape of the hand, and are important to consider and preserve when playing the instrument (see Figure 4.1).

FIBROUS ARCHES



Figure 4.1. Arches of the hand.

Tubiana points out that each part of the hand bone structure directly and indirectly influences all other parts; it is an extremely subtle equilibrium of mobile balance. For

example, the wrist position affects the positions of joints between finger and hand bones, which in turn alter positions of inner joints between finger bones (inter-phalangeal joints). It is of great significance for musicians to realize that the position of the wrist also affects the power of the fingers. As Tubiana explains, the complete closing of the fingers is only possible if the wrist is in slight extension. On the other hand, when the wrist is flexed (bent toward the inner side of the forearm), the fingers automatically open slightly and lose their power. This interdependence explains why the movements of the wrist (usually in reverse to the finger movement) enhance the action of the forearm muscles that control the fingers. According to Tubiana and Chamagne the fingers express the greatest strength with the wrist in slight ulnar deviation (turned toward the little finger) and in slight (about 15 degrees) extension.

Motor control and sensation in the arm and hand are supplied by the peripheral nervous system through three main nerves (radial, median and ulnar) that originate at the cervical region of the spine (mostly between the 5-8 cervical and the first thoracic vertebrae). The sensation in the little finger side of the hand is provided by the ulnar nerve, whereas the median nerve controls the area toward the thumb and on the surface of the palm.

Special Considerations for Violinists

Clearly, the great anatomic complexity and subtlety permits incredible precision and variety of the movement of the upper limb. On the other hand, these intricate structures may easily fall victim to a variety of overuse injuries if not treated carefully. Paull warns that pain which occurs in the arm or hand while playing should never be ignored.⁵² The only cause for such pain can be direct trauma (for example aftermath of broken arm, etc.); otherwise, it signifies that the body is being hurt (either by faulty technique or overpracticing). The onset of pain does not always indicate the origin of the problem. Arm pain above the elbow may be a result of a pinched nerve in the neck or of shoulder injury. The pain in both the arm and the forearm is most commonly due to faulty wrist positioning or overuse of wrist movements while playing. If the arm hurts down the back of the forearm and in the elbow area just outside the point, this may indicate nerve compression and is also usually caused again by incorrect usage of the wrist. When the hand is flexed, the muscles originating at the elbow and running down the back of the forearm to move the fingers are in full stretch. Playing in such a position for extended periods of time will cause problems in the hand, especially in the back of the hand, and the elbow.

⁵² Paull and Harrison, *The Athletic Musician*, 82.

Common Injuries and Their Causes

Common upper limb injuries among violinists include tendonitis, carpal tunnel syndrome, cubital tunnel syndrome, tennis elbow (epicondylitis), De Quervain's tenosynovitis, and osteoarthritis. One of the most prevalent playing-related injuries is tendonitis of the forearm, wrist, or fingers. Otis Alton Barron and Richard G. Eaton believe that performing artists usually experience at least one episode of this condition during the span of their career.⁵³ This injury is usually caused by excessive finger motion or pressure, as well as excessive movements of the wrist. The tendon sheaths of the finger flexor and extensor muscles run out of their lubrication (usually as a result of practicing for too many hours or from not taking enough breaks). Consequently, irritation, pain, swelling, and inflammation of the tendons occur, comprising tendonitis. Paull suggests immediate rest from playing for a couple of days to prevent the formation of scar tissue, which could result in nerve entrapments. Continuing to overpractice can lead to chronic tendonitis, which puts the performer's career at risk. Tennis elbow, also known as epicondylitis, is a condition manifesting itself by isolated pain at the insertion point of the wrist extensor muscles (these muscles raise the hand up at the wrist). This injury may result when frequent use of the wrist extensor muscles is required. Horvath calls for upper string musicians to protect their elbows and avoid prolonged twisting of their left arms.⁵⁴ Also, ensure that the wrist does not stay in an extended position while playing; sometimes violinists like to keep their wrists close to the neck of the instrument

⁵³ Barron and Eaton, "The Upper Limb of the Performing Artist," 243.

⁵⁴ Horvath, *Playing (less) Hurt*, 80.

in a so called "pancake wrist" position, which can contribute to falling victim to this injury (see Figure 4.2).

Cubital tunnel syndrome is also an injury located at the elbow. The ulnar nerve, as it runs from the neck to the arm, forearm and hand, has to pass through a cubital tunnel at the elbow joint. Whenever the arm is flexed (bent), the ulnar nerve becomes compressed. Most instrumentalists for many hours are required to keep at least one of their elbows bent at angles lesser than 90 degrees for many hours, and that causes further narrowing of the cubital tunnel.

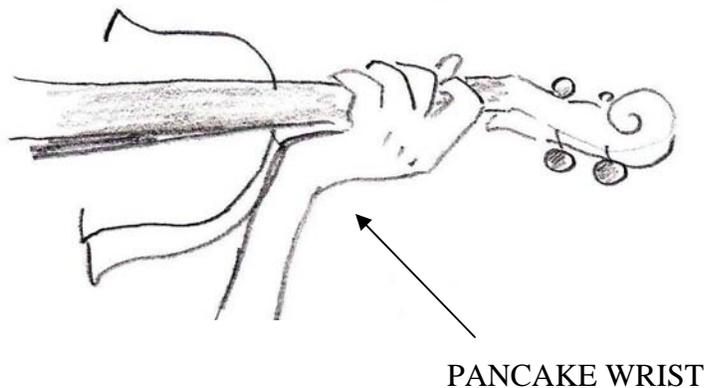


Figure 4.2. Faulty wrist position.

Violinists are in greatest danger of this injury by adding twisting motions while the arm is bent. For example, above the 7th position, the contraction of the finger flexor muscles results in highest level of ulnar nerve compression. This injury is signaled by

pain and numbness radiating down the little finger side of the hand; both on top and palm side. Horvath advises violinists to allow their arms to hang down and rest as often as possible, even during the performance. Paull notes that this syndrome is frequently due to faulty wrist positioning, as well as the overuse of wrist movements while playing. She also adds that elbows have a so called “carrying angle,” and performers need to remember to keep the elbows slightly bent when carrying heavy objects.

Carpal tunnel syndrome is the most common cumulative trauma disorder, well-known as computer users’ malady. The number of people suffering from this condition keeps rising (for example 27, 000 cases reported in 1989 and by 1999 the number reached 147 000).⁵⁵ Among musicians, this syndrome constitutes the most widespread nerve entrapment (nerve compression) injury of the upper limb. As previously described, the median nerve is one of the main nerves controlling the arm and hand. To reach the hand, it needs to traverse a narrow tunnel at the wrist (carpal tunnel) along with tendons of flexor muscles that bend the fingers. As fingers move, the tendon sheaths slide against each other. If the tendons or tendon sheaths become inflamed, swollen, or thickened, the median nerve can be compressed (see Figure 4.3).

⁵⁵ Horvath, *Playing (less) Hurt*, 79.

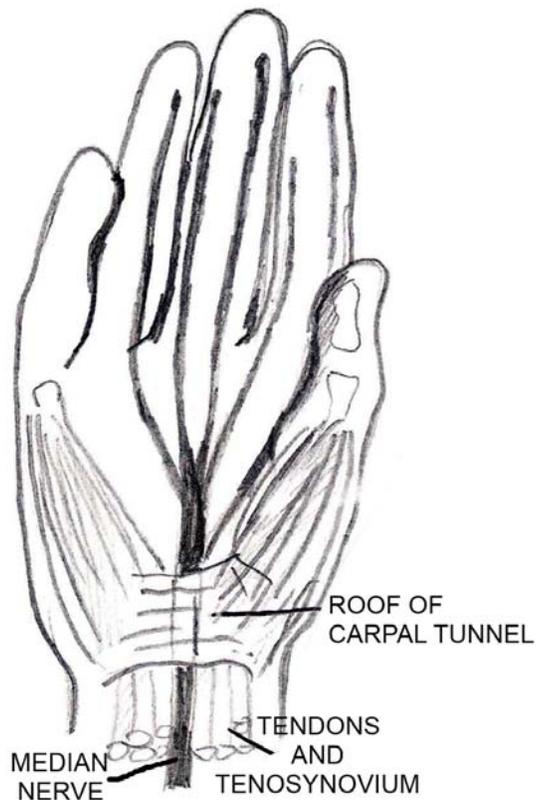


Figure 4.3. Carpal Tunnel.

Playing musical instruments, and especially the violin, requires a combination of finger and wrist flexion (for example, high positions on the violin). These movements bring the tendons closer toward the front part of the tunnel, where the median nerve passes. Those suffering from this injury report pain, a burning sensation in the hand, as well as numbness and tingling in the fingertips, usually excluding the little finger. The symptoms tend to be more intense initially; as the condition becomes chronic, the sensations lessen as the hand turns hypoesthetic (numb). Pain can radiate as far as to the shoulder. Simple daily activities such as holding a phone or turning the doorknob can present great difficulty if this condition is advanced. Horvath notes that in such cases the

only way of avoiding permanent nerve damage may be surgical intervention. To lessen the risk of this injury, violinists need to consider the natural (neutral) position of the wrist and avoid exaggerated wrist motions in both hands. To minimize flexion of the left wrist in high positions, it is important to help with the whole arm and bring the elbow further in towards the right. Another way to prevent this condition is to avoid reaching for single notes, but instead again involve the whole arm, while keeping the wrist in its neutral position.

Another common malady of the string player, De Quervain's Tenosynovitis, involves inflammation of the tendon sheaths (synovial membranes) at the base of the thumb. There are two groups of muscle tendons that pull the thumb outward and away from the hand. These tendons run through a narrow tunnel on the thumb side of the wrist. The overuse and repetitive motions can result in inflammation of the tendons and tendon sheaths. As the synovial membranes thicken due to inflammation, the passage through the tunnel is obstructed. De Quervain's Tenosynovitis is signaled by pain accompanying most thumb movements, especially during twisting motions. Horvath notes that it is important to keep the thumbs slightly flexed (curved) at all times; maintaining a straight thumb stresses the thumb joint. Interestingly, as mentioned before, the thumb and the little finger share a common muscle. Often, this may lead to the notion that the weak little finger needs more strengthening exercises. The solution, however, may lie in relaxing the thumb. Violinists need to be careful not to squeeze the neck of the instrument and keep the left thumb in its natural position. The same applies to the bow

hand; the thumb needs to remain slightly curved, bending more at the frog. A rigid wrist is a signal of excessive thumb pressure.

Osteoarthritis is a disease indicated by disintegration of the cartilage. As cartilage can not function properly under such a condition, excessive stress is transmitted to the underlying bones during movements. This results in the narrowing of the joint space and the occurrence of cystic lesions, eburnation (abnormally heightened density of bones), and osteophyte (additional bone) formations. Until recently, it was believed that this disease develops as one of the effects of aging. Up to date studies show, however, that age has little to do with the onset of this illness. Conversely, repeated trauma is thought to be a major cause of osteoarthritis. Persons who play a musical instrument may be at higher risk for this condition.

Additional Notes Regarding the Most Physiologically Natural Position of the Hand and Wrist

The most natural position of the violinist's hand is so described by Tubiana in the following passage:

The arm is in nearly complete external rotation, facilitating complete supination of the forearm. The wrist remains free and varies in position from flexion where there is a finger extension, to slight extension when the fingers are flexed. The normal inclination of the wrist is 15 degrees to the ulnar side. The thumb is maximally spread apart from the hand opposite the middle finger....The fingers

are placed on the strings so that maximal pulp contact is achieved. When contact with the string is relaxed, the finger returns to its normal flexed position.⁵⁶

In order to find this most natural position of the left hand, first allow the arm to hang down normally; observe that while doing so, the thumb is opposite the index finger. When the arm is supinated (turned counter-clockwise), the thumb is opposite to the middle finger. Thus, this is most neutral position for the violin player's left hand. The most natural wrist position does not indicate that the wrist needs to be flat. The neutral position of the wrist is about 25 degrees flexion toward the hand. It can also be helpful to imagine that the left hand is hanging down from the fingertips rather than pressing the string. To find the most natural position for the wrist, it is advised to either make a fist (the hand and wrist automatically will assume the most efficient position) or grip an object very firmly. It is important to add that most natural position for the fingers and thumb is when they are slightly curved. Another important element to remember is to release the fingers that are not playing immediately. The strength of the fingers comes from the back and the arms, not really the fingers themselves.

Yoga and Upper Limb Injuries

As stressed throughout this paper, Yoga practice can be helpful in a variety of ways. It addresses the whole body as well as particular areas, and thus influences

⁵⁶Tubiana, Chamagne and Brockman, "Fundamental Positions for Instrumental Musicians," 194.

performing ability. Interestingly, several studies investigate the benefits of Yoga as it relates to upper limbs. I will discuss here three examples: “Yoga-Based Intervention for Carpal Tunnel Syndrome” by Marian S. Garfinkel et al., “Evaluation of Yoga based Regimen for Treatment of Osteoarthritis of Hands,” also by Garfinkel, and “Yoga Training and Motor Speed Based on a Finger Tapping Task,” by Manoj Dash.

Marian S. Garfinkel’s article examines the effectiveness of a Yoga-based regimen for relieving symptoms of carpal tunnel syndrome.⁵⁷ In this study, 42 individuals with clinically diagnosed carpal tunnel syndrome were randomly divided into two groups. One group was subjected to an eight week program consisting of Yoga poses with focus on the upper body. The other group, the control group, was offered a standard treatment including a wrist splint. The group with Yoga based intervention received eleven poses specifically chosen to improve flexibility and alignment of the hands, wrists, arms, and shoulders. Moreover, these poses were aimed at strengthening, stretching and balancing each joint and increasing the awareness of optimal positions for joints during use. This study used the Iyengar approach to Yoga, because authors believed it to be the most beneficial as it stresses the proper structural alignments and offers possible adjustments to meet the physical conditions of patients. The poses offered by this program are listed and briefly described below (see Figure 4. 4). Throughout the eight week period, the Yoga group participants attended one and a half hour classes, twice weekly.

⁵⁷ Garfinkel et al. “Yoga-Based Intervention for Carpal Tunnel Syndrome,” 1601-603.

Asanas Used for Carpal Tunnel Syndrome	Description
<i>Dandasana</i> (sitting with extension of the torso)	Sit on a chair with the torso upright. Hands press into the seat. Press the shoulder blades into the back. The shoulders move back and down.
<i>Namaste</i> (hands in prayer position)	Press palms and fingers of each hand together. Release and repeat with fingers spread as widely as possible
<i>Urdhva Hastasana</i> (arms extended overhead)	The arms and fingers stretch forward and up. Open palms, keep fingers together and lock the elbows. Arms remain straight, lift sides of the body.
<i>Parvatanasana</i> (arms extended overhead with fingers interlocked)	Interlock the fingers, with the right thumb base over the left. Palms turn out and arms stretch forward and up.
<i>Bharadvajasana</i> (chair twists)	While sitting sideways on a chair (right hip and thigh touch the back of the chair), turn toward the back of the chair. Place the hands on the back of the chair. Keep turning. Ultimately one is looking over the right shoulder.
<i>Tadasana</i> (standing mountain pose)	Stand straight in bare feet. Balance weight evenly on inner and outer edges of both feet. Lift knee caps. Raise upper chest and collarbones.
<i>Half Uttanasana</i> (90 degree forward bend to wall)	Stand with feet hip width apart. Extend the arms overhead. Bend from the hips. The whole body stretches toward the wall, while the hands touch the wall.
<i>Virabhadrasana I Arms</i> (arms extended overhead with palms together)	Stand in <i>Tadasana</i> . Stretch arms to sides at shoulder level. Turn palms towards the ceiling. Keeping the arms straight extend them overhead, then bring them slightly back and join palms together.
<i>Urdhva Mukha Svanasana</i> (dog pose with chair)	Stand with feet hip width apart in front of the chair seat. Bend from the hips, place hands on the seat, shoulder width apart. Extend arms and lift waist, hips and knees slightly above the chair.
<i>Namaste</i> (hands in prayer position behind the back)	Start in <i>Tadasana</i> . Join palms behind the back. Fingers point down.
Relaxation	Lie on the back. Remain in the pose for 10 to 15 minutes.

Figure 4.4. Adapted from Garfinkel et al., “Yoga-Based Intervention for Carpal Tunnel Syndrome,” 1602.

Each session started and ended with entering into the Corpse Pose (*Shavasana*), the pose that authors believe to counteract the negative effects of prolonged stress and chronic pain. See Figure 4. 5.

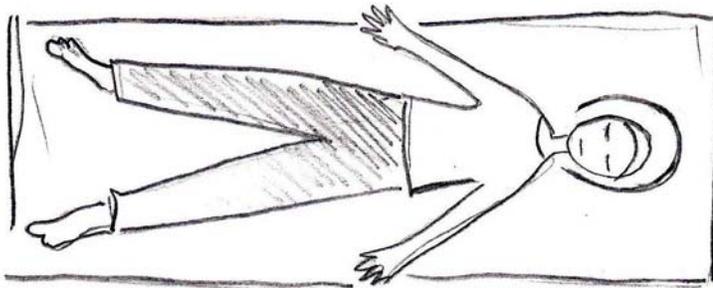


Figure 4.5. *Shavasana*.

The results of this study suggest that the Yoga-based program is more effective for treatment of carpal tunnel syndrome than the standard wrist splint application as used by the control group. In comparison to the control group, the Yoga group showed much greater improvements in grip strength, Phalen sign (indicating to what degree the median nerve is free of negative effects resulting from flexion of the wrist), and greater reduction of pain.

The goal of another study, entitled “Regimen for Treatment of Osteoarthritis of the Hands,” was to collect controlled observations of the effects of Yoga practice on the

hands of patients with clinically determined osteoarthritis (OA).⁵⁸ These individuals suffered from pain, aching, and stiffness in the hands. Traditional treatment of this condition includes the administration of anti-inflammatory medicines, avoidance of weight bearing activities, and the application of special range of motion exercises. The patients involved in this study were divided into two groups, one receiving Yoga regimen and the control group which was submitted to traditional treatment. The Yoga-based program included one hour weekly classes for a ten week period. The classes consisted of supervised Yoga end relaxation techniques aimed at increasing the range of motion of the finger joints, improving the hand's grip strength and its general functioning, as well as decreasing the swelling, pain, and tenderness of the finger joints. Yoga poses used in the regimen were designed to stretch and strengthen the upper body with the emphasis on the extensions and proper alignment, such as in *Parvatasana* Pose. To actualize this pose, raise and stretch the arms above the head and intertwine the fingers while turning the palms upward, remembering to lift the arms from the shoulder blades. See Figure 4.6. The patients were strongly encouraged to pay attention to their breathing at all times. The results of this study suggest that the Yoga regimen was more effective than standard therapy. The most dramatic difference between the control and Yoga groups was indicated by the level of finger joint tenderness reduction. Also, the Yoga group achieved a greater increase in the range of motion, and a greater decrease of pain during activities.

⁵⁸ Garfinkel et al., "Regimen for Treatment of Osteoarthritis of the Hands," 2341-3.

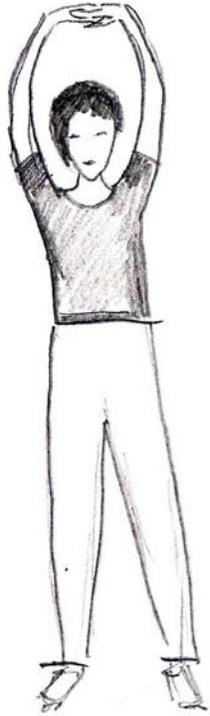


Figure 4.6. *Parvatasana*.

In their study, Manoj Dash and Shirley Telles report that Yoga practice may be highly beneficial for improvements of dexterity and fine control of the hand, qualities that every musician seeks.⁵⁹ The speed (frequency) of successive, rapid, and alternating movements has been determined as a standard method for evaluation of the motor function of the hand. The monitoring of finger tapping can be used as a way to evaluate motor speed (one of the aspects of the motor function). The number of taps in a given time signifies the level of motor speed ability. In this study the authors observed the

⁵⁹ Dash and Telles, “Yoga Training and Motor Speed Based on a Finger Tapping Task,” www.vivekanandayoga.com/research.../19990603_ytmsbftt.pdf, 1-5.

effects of a Yoga program concentrating on finger tapping speed in groups of both adults and children. The assessments were made at the beginning and end of a thirty day period, during which one group was practicing certain Yoga techniques and poses while the control group carried on with ordinary activities. Each age group was divided into a control and Yoga group. The Yoga group received about eight hours of Yoga training a day, its focus including physical (*asanas*), mental (*pranayama*), intellectual, and spiritual aspects. All these techniques were directed toward the improvement of physical stamina and mental balance, relaxation, and the enhancement of inner awareness. The findings of the study show that, in comparison to the control groups, the Yoga groups obtained much higher speeds of tapping compared to their initial speed before entering the program. These results suggest that Yoga practice can be an effective tool for promoting greater motor speed for repetitive finger movements.

Yoga Poses for the Upper Limb

As mentioned previously, Yoga poses address more than just one part of the body at the time. Instead, they improve the health of groups of muscles and joints, as well as all systems of the organism (internal organs, nervous, vascular, and endocrine systems). The following poses are particularly beneficial for the upper limbs and have been described in detail in previous chapters: Downward Dog (see p.51-52), Upward Dog (see p.39-40), *Yoga Mudra* (p.24-25), Stretch on the Wall (p.64), Shoulder Rolls (p. 61), Plank Pose (p. 39-40), and Eagle Arms (p.62). In addition, Mia Olson's "hand exercises" can also be

helpful, especially in releasing accumulated tension from long hours of playing the instrument.⁶⁰

1. *Hand Exercise*

To perform Olson's "hand exercise," extend the right arm in front of the body, with the elbow straightened, as if gesticulating for someone to stop. Then press with the left hand all the fingers of the right hand (including the thumb) toward the body, stretching the under part of the arm and wrist. It is important to relax the neck and shoulders and breathe deeply. After holding for several breathes, release the stretch and shake the right arm and hand. See Figure 4.7.

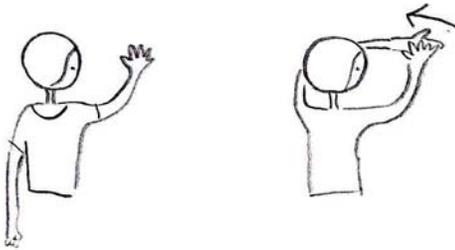


Figure 4.7. Hand exercise.

⁶⁰ Olsen and Feist, *Musician's Yoga*, 56-57.

2. Hand Exercise 2.

Then stretch downwards; again extending the right arm in front of the body with the straightened elbow, but this time bending the wrist with the fingers pointing down. The left hand gently draws the back of the hand and fingers toward the body; the top part of the arm stretches. After several breaths one releases the stretch, subsequently shaking the right arm and hand. The sequence is then repeated with the other hand. See Figure 4.8. Olson also suggests wrist and arm rotations.

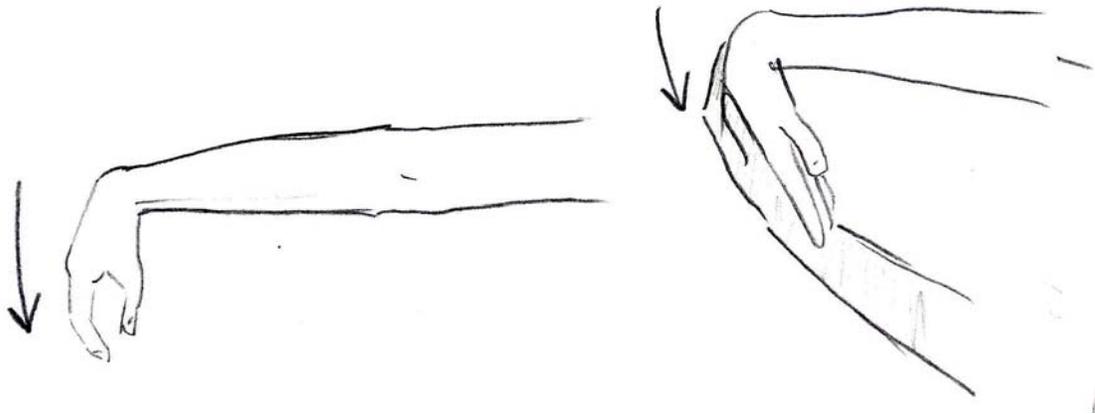


Figure 4.8. Hand exercise 2.

I would like to include several additional poses that I find especially effective. These poses are slightly more advanced, although several variations exist that are more accessible to a larger number of practitioners. *Marichyasana* is a pose dedicated to the great sage Marichi. This *asana* has many benefits as it increases energy levels, tones and massages the abdominal organs, and alleviates the back pains. As noted from personal observation, it provides a deeply relaxing massage to the entire upper limb (shoulders, arms, and hands). Additionally, it improves flexibility, including that of the hands and

fingers. To perform this pose, begin by sitting on the floor. David Swenson provides the instruction for the execution of this *asana* (see Figure 4.9):

Exhale, and bend the right leg placing the heel near the right sit-bone with the right knee pointing toward the sky. Wrap the right arm around the right leg using equality of opposition as leverage. Clasp both hands behind the back. Fold forward. If you are not clasping the hands then leave them on the floor or hold the left leg with both hands. Inhale, lengthen the spine and take your gaze to the horizon. Exhale and fold forward into whichever option is most appropriate for you. Remain here for five deep breaths. Inhale, lift the head and lengthen the spine. Exhale, release the asana and straighten both legs. Repeat on the left side.⁶¹

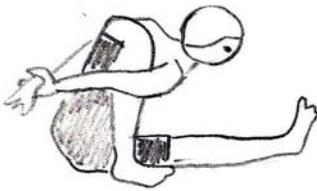


Figure 4.9. *Marichyasana*

Besides reliving fatigue, lengthening the spine and improving its alignment, *Halasana*, or Plow Pose, also addresses the entire upper limb area. It also relieves pain and cramps in the fingers, wrists, elbows, and shoulders. David Swenson suggests (see Figure 4.10):

Exhale, lower the feet toward the floor over your head with the feet together. Keep the legs straight and interlace the fingers. Straighten the arms and pull the hands to the floor behind the back. If it is too much to take the feet all the way to the floor you may rest them on a chair behind you or lower them only half way to

⁶¹ David Swenson, *Ashtanga Yoga*, 90.

the floor and support the hips with the hands. Remain here for five deep breaths. Inhale, release the fingers and place the palms flat on the floor.⁶²

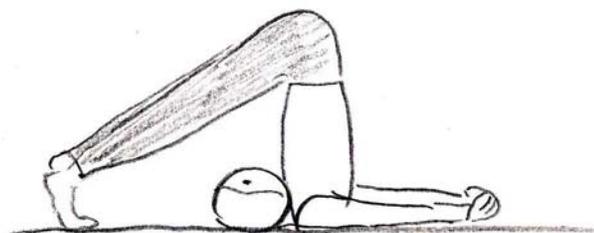


Figure 4.10. *Halasana*.

To Swenson's description I would add that the wall can also be used to rest the feet instead of the chair (some schools of Yoga also make this pose easier by placing folded blankets under the shoulders).

Another useful pose addressing the arms, wrists, and hands, as well as the chest, is *Adho Mukha Vrksasana* (Downward Facing Tree or Handstand in English). This pose was briefly discussed in Chapter 1, as a part of Robert Boustany recommendation for working on posture in general (see p. 34). Handstand builds strength and balance as it develops the chest and strengthens the whole upper limb.⁶³ This is how Doug Swenson suggests performing this pose. Begin from the Downward Dog Pose while the hands are placed a few inches from the wall and the fingers are spread wide. After bending the left

⁶² David Swenson, *Ashtanga Yoga*, 90.

⁶³ Doug Swenson, *Power Yoga*, 208.

knee and stepping the left foot forward (about two feet behind the hands), use the bent left leg to propel the body off the floor, throwing the weight onto the arms and hands. The arms are straight, the head drops down, and the hips are lifted upward. Then straighten the legs and rest the feet against the wall. The pose should be held for five deep breaths and repeated twice for a total of three repetitions. To finish, place the feet back on the floor and rest, lying down on the back. (As mentioned before, this pose is demanding and caution is required). See Figure 4.11.

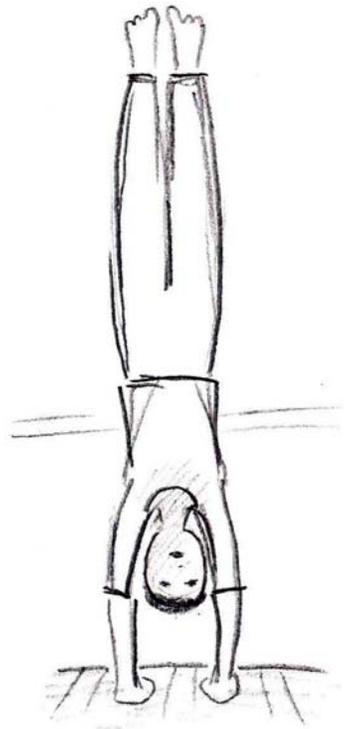


Figure 4.11. *Adho Mukha Vrksasana* (Handstand)

CHAPTER 5

PERFORMANCE SUCCESS AND YOGA

I feel nothing but awe and appreciation for elite-level musicianship, but my work in the field has proved one thing, if nothing else. When proverbial chips are down, it doesn't matter how fast you can trill, what conservatory you attended, or what chorus you sing in: stress can make you or break you.⁶⁴

These are the words of Don Greene, Ph. D., who is one of the most sought-after audition coaches. The previous chapters have focused on various physical aspects of playing the instrument and the ways in which Yoga practice can be effective in dealing with such challenges. This chapter will explore the views of a variety of authorities on psychological components of music making and demonstrate usefulness of Yoga as illustrated by scientific research with respect to this issue. As previously mentioned, the uniqueness of Yoga lies in its inclusion of both physical and mental elements as it involves the whole person, and unifies physical, emotional, mental and spiritual planes.

What makes a musician successful? It is obvious that a high level of technical proficiency must be achieved in order to be able to communicate and execute musical ideas, but as Greene observes, this may be irrelevant if the performer cannot handle the stress of performing under extreme pressure. There are countless examples of talented musicians who never fulfilled their potential because of debilitating stage fright; one of

⁶⁴ Greene, *Performance Success*, 15.

the most famous examples being Finnish composer and violinist Jean Sibelius, who, after auditioning for the Vienna Philharmonic, was advised to never perform again. Drawing from personal experience and information provided by available sources, I believe that the practice of Yoga—its meditative techniques, as well as breathing and *asanas*— offers a set of tools that can be of great help in dealing with these problems. Although a popular prescription, pharmacological treatment of performance anxiety is not a valid option for many musicians; anti-anxiety medicines often negatively affect the fine motor control, which is critical to demanding, high-level performance.

All renowned Yoga masters teach that the relation between breath and the state of mind is of great importance. Awareness and control of the breath translates into controlling and quieting the mind. Noticing the breath and applying relaxing meditative techniques relieves stress. B. K. S. Iyengar states that while *asanas* may appear to deal mostly with the physical body, they in fact influence chemical messages sent to and from the brain, thus improving and stabilizing the mental state.⁶⁵ The practice and philosophy of Yoga has proven to be a great inspiration for many respected teachers, authorities, and musicians. One such example is Timothy Gallwey and his book entitled *Inner Game of Tennis*. Overtly, the book addresses the challenges encountered by tennis players, but ultimately, it gives invaluable insights into the issues related to any kind of performance. *Inner Game* became one of the most influential texts used by music teachers throughout the world. Gallwey's approach seemed revolutionary when the book was first published

⁶⁵ Iyengar, *Yoga: The Path to Holistic Health*, 10.

as it was deemed so incredibly helpful. It must be noted that his ideas and discoveries are deeply rooted in the philosophy and practice of Yoga. Gallwey wrote *Inner Game of Tennis* as a result of years of inner search for the most effective ways of teaching and learning and also after studying Yoga and meditation with Guru Maharaji (Gallwey's method was originally called "tennis yoga"). The essence of Gallwey's message is well portrayed by following fragment from his book:

Neither mastery nor satisfaction can be found in the playing of any game without giving some attention to the relatively neglected skills of the inner game. This is the game that takes place in the mind of the player, and it is played against such obstacles as lapses of concentration, nervousness, self-doubt and self-condemnation.⁶⁶

The first step, and the fundament of mastering the inner game, involves quieting the mind and letting go of negative inner dialogue. Gallwey introduces here the concepts of Self 1 and Self 2, where Self 1 represents the conscious, ego driven mind (the part of us which tells us what to do), while Self 2 corresponds with our natural capabilities (it is the "doer"). A still (quiet) mind enables one to better observe reality, free of any preconceptions (for example what we are doing while playing a difficult passage). Abandoning judgments and instead noticing what is happening is the key skill of the inner game. Yoga practice assists in developing this ability. The classic purpose of Hatha yoga was to prepare the body and mind for deep concentration and ultimately meditation in order to free it from *chittavritti* (modifications of the mind or, in other

⁶⁶ Gallwey, *Inner Game of Tennis*, Introduction.

words, imbalanced mental states).⁶⁷ Yoga develops and cultivates the ability to quiet the mind and thus assists in improving focus. Gallwey's book offers invaluable insight into mastering any art. I also believe that the practice of Yoga can make Gallwey's instructions even more understandable and can assist in mastering the skills of the inner game. Also, since Yoga was a fundament of Gallwey's discoveries, practicing it may lead to some new, useful personal insights.

Katie Lanzer, a pianist and college professor, incorporates Yoga's ancient wisdom to improve her teaching methods as well as performance. In her article "Yoga and Piano," Lanzer states:

Through the practice of Yoga, I have found relief from the perpetual tension and pain that used to accompany my playing. After years of searching for the "right" way to play, I have discovered that the solution to my struggles is not in any prescribed method or well-meaning teacher. The answers lie within my own body as I learn to become keenly aware of every motion I make.⁶⁸

Yoga helped Lanzer, not only with the challenges she faced as a performer, but also changed her attitude as a teacher. Now she strives not to be an authoritarian but rather a guide, urging self exploration and discovery. Lanzer proposes building on Yoga's wisdom as explained by T. K. V. Desikachar with regards to practicing an instrument. The first step to gaining self knowledge is *tapas*, a concept coming from the

⁶⁷ Iyengar, *Light on Yoga*, 23.

⁶⁸ Lanzer, "Yoga and Piano," 26.

root word *tap*, to heat or cleanse.⁶⁹ In the Yoga tradition, *asanas* and *pranayama* are means of cleansing the body and mind. As the body becomes healthy and the mind learns to be still, harmful habits can be discarded, opening the way to new possibilities. Desikachar suggests that regular practice of Yoga eventually creates the ability to stay present in every moment. Only then can the achievement of an awareness of body movements allow decisions about what is enabling and what is hindering progress. Thus, it is crucial to strive to be as mindful as possible when practicing, to quiet the mind chatter and concentrate on some simple element of what we are doing. The next step towards unifying body and mind is *svadhyaya*, which translates to study or investigation. This is a stage of experimentation, asking questions, deciding on methods of practice, accessing what works, abandoning ineffective actions, and investigating the musical aspects, all while being mindful and free of preconceptions. The final phase is called *isvarapranidhana*; traditionally translated as “love of God.” This term, however, can also be understood as an action or work performed with a certain detachment, without clinging to the outcome.⁷⁰ It is in this stage that the technique and the physical motions are transcended; they were never truly the goal of our striving, even though sometimes it is easy to forget about it in the midst of the search for perfection. All of that is transcended to allow the body and mind to unify and truly express the music.

Dr. Greene, who was mentioned at the beginning of this chapter, was once the sport psychologist for elite athletes of the U.S. Olympic Diving Team. However, after becoming more acquainted with the demands of the musician’s life, he became interested

⁶⁹ Desikachar, *The Heart of Yoga*, 13.

⁷⁰ Desikachar, *The Heart of Yoga*, 13.

in working with members of many renowned symphonies (Metropolitan Opera Orchestra, New York Philharmonic) and ultimately devoted all his time to helping musicians. When dealing with performance anxiety, Greene suggests learning a skill called Centering.⁷¹ The Centering method aids in shifting thought processes from the left hemisphere of the brain to that of the right hemisphere. Greene advises to apply this technique before performing. He explains that the brain's right hemisphere works much more efficiently while performing; the mind is much quieter and more focused as it mostly emits alpha waves which promote deeper levels of concentration, tranquility, and create the impression of a slower passage of time. Left brain thinking is done in words more so than by images and sounds. It tends to be more scattered and forgetful. The left brain emits beta waves. It is a plane where negative inner dialogues (of anxiety, self doubt, and fear) can take place during the performance.⁷² Centering involves focusing on the breath, noticing specific areas of the body, releasing tension from different parts of the body through visualizing its release during the exhale, and focusing on the center point of the body. In the Yoga tradition, the center of the body (the center of gravity) corresponds to *Svadhithana Chakra* (the energy center just below the navel) and was believed to be a location of the *prana* (life force). Clearly, most of the elements of the Centering technique are borrowed from meditative and relaxation Yoga techniques. Greene also mentions additional important information about the nature of our subconscious as discovered by Dr. Maxwell Maltz (directions including negation are not effective; the

⁷¹ This method was developed by Dr. Robert Nideffer in the 1970's.

⁷² It is interesting to note that Gallwey's Self 1 and Self 2 seem to correspond to left and right brain characteristics respectively.

subconscious mind will react to the direction as if there was no “no” in it, for example, “don’t rush” will be interpreted as “rush”...).⁷³

My Experience

When musicians are working on mastering a difficult passage or overcoming a general technical difficulty, I have observed that we tend to either feel overwhelmed by not knowing how to fix the problem, or we try to control every muscle of our bodies to correct it. It commonly happens that we try too hard, and in the end there is no improvement. The focused awareness can be a way out of such a situation: by simply observing what is going on we may realize that the source of the problem lies not where we thought it did. Another benefit of this approach is that by observing and quieting the mind, we give our body a chance to do things in the most natural way, just allowing them to happen. The movements required to perform a virtuosic passages are often too complex to be controlled at all times by the conscious mind. While the Self 1 observes what is going on, our Self 2 (our body) is freed to find the natural way to perform difficult motion. Instead of forcing, we allow. All this advice is encompassed in the teachings of Yoga; being present and paying attention, observing reality free of attachment (preconception), *ahimsa* (gentleness) in treating oneself during the process of learning. The lessons that prove to be invaluable in mastering an instrument are taught by Yoga.

⁷³ Greene, *Performance Success*, 50.

As a violinist, I find that paying attention to the exact spot where the bow hair touches the string can serve as a way to bring oneself into the present. The bow hair almost always stays in contact with the string, and that constancy reminds me of the breath. I used to struggle with searching for the “right” position of my left hand. The control of the speed of my fingers in fast passages was a challenge. I tried pretty much everything but the solution kept eluding me. The most frustrating part of this problem was that no amount of practicing seemed to help. What finally worked was a change of focus. For a little while, I decided to let go of my struggle and simply concentrated on the bow hand. I kept my attention and also “felt” specifically the spot where the bow touched the string. Sometime in the process, I realized that I was comfortable with my left hand. This was a great revelation for me—finally, I was relaxed. From that moment on, I was on the path of noticing small, subtle elements which my body changed unconsciously, but that made my playing more effortless. I believe this is what Gallwey means when he talks about a more natural way of learning.

Also, similarly to Katie Lanzer, I realized that the answers to my questions can oftentimes (if not always) be found within my own body, if the mind is still. I also noticed that mindfulness during practicing is a way to deal with performance anxiety. If I manage to practice with great focus, completely (as much as possible) immersed in the moment and the music I am playing, when the time comes for the performance, I am much calmer. Since my mind is trained to concentrate on various aspects of playing my instrument, there is not much space left for inner dialogue, even under pressure.

Scientific Research

As one may observe, the philosophy of Yoga is acknowledged and utilized by important authorities in the field of music and sport when aiming to enhance performance. Modern science is also beginning to verify the wisdom of the Vedic texts. A growing body of scientific evidence is being gathered that shows the effectiveness of Yoga in overcoming various psychological challenges. For example, a 2004 pilot study investigated the effects of Iyengar style Yoga on mood changes.⁷⁴ The results of this study reported substantial increases in positive moods, decreases in negative moods, and general increases of energy levels among participants.

In a recent Lancet article “Yoga for Anxiety and Depression,” the author reviews some of the most significant studies investigating Yoga and its effects on stress and depression.⁷⁵ For example, a 2008 study at the University of Utah examined response to stress and pain within three varied groups of participants. The researchers noted that persons exhibiting poorly regulated response to stress were also more sensitive to pain. The findings of this study showed that the group of Yoga practitioners (as confirmed by functional MRI tests) had the lowest pain-related brain activity and the highest pain tolerance. These results underscore the value of Yoga’s benefits in regulating the stress response and, thus, perception of pain. The author also mentions a 2005 study undertaken on inpatients of the New Hampshire Psychiatric Hospital that reports a significant drop of

⁷⁴ Shapiro and Cline, “Mood Changes Associated with Iyengar Yoga Practices,” 35-44.

⁷⁵ “Yoga for Anxiety and Depression,” *Harvard Mental Health Letter* (April 2009), http://www.health.harvard.edu/newsletters/Harvard_Mental_Health_Letter/2009/April/Yoga-for-anxiety-and-depression.

tension, anxiety, and depression after a single Yoga session. Furthermore, Yoga proved to be effective in assisting patients with post traumatic stress disorders (PTSD) as shown by a study that examined disabled Australian and Vietnam veterans suffering from PTSD. Patients underwent six weeks long treatment including breathing exercises, *asanas*, and guided meditation. The results showed that the symptoms of patients' PTSD dropped from severe to mild levels (the control group reported no improvement).

Within the last decade, a small number of studies targeting musicians have examined Yoga's value as an intervention for performing anxiety. A 2003 study conducted by Chang et al. investigated effects of an eight week meditation course on college music students. Participants trained to meditate showed a significant reduction in post-performance anxiety, as well as a tendency towards more focus and less interference by intrusive negative thoughts during solo performance. The control group showed no change. In 2001, Lin et al. further explored the relationship between performance anxiety and the quality of musical performance.⁷⁶ Khalsa et al. conducted two studies (in 2006 and 2009), which included young musicians enrolled in the Tanglewood Summer Music Program. The purpose of the 2009 study was conducted simply to further extend the 2006 preliminary findings, aiming to record more data by using a larger sample. The musicians participated in a two month Yoga and meditation program and were divided into three groups: a Yoga lifestyle intervention group that involved discussion sessions in addition to Yoga and meditation, a Yoga and meditation group only, and a control

⁷⁶Chang et al. "The Effects of Meditation on Music Performance Anxiety,"126-30; Lin et al., "Silent Illumination," 139-55; both quoted in Khalsa et al., "Yoga Ameliorates Anxiety and Mood Disturbances," 280.

group. Consistent with the results of the 2006 Khalsa study, the Yoga program showed a statistical tendency to reduce the cognitive and somatic symptoms of musical performance anxiety and improved mood in both Yoga groups. It is worth mentioning that participants found that yogic breath control techniques were particularly helpful when managing the anxiety, especially immediately before the concert.

What makes Yoga so helpful? The authors of the article “Yoga Therapy in Practice” state:

Embedded within the philosophy of Yoga, particularly in the Yoga Sutras of Patanjali, is a cognitive-behavioral “manual” that addresses the symptoms of anxiety and depression. Yoga teaches the mind to yoke itself to the present moment.⁷⁷

As illustrated above, research reports that the practice of Yoga reduces the levels of perceived stress and anxiety. How does this happen? Stress, anxiety, and depression are linked to a hyperactive limbic system and hypoactive cortex. The limbic system, which is part of the autonomous (unconscious) nervous system, is mainly responsible for storing memories and triggering the “fight or flight” response. The perception of stress affects stress response systems. Since this structure is connected with memory, the perception of present experiences may be tinted with past traumas. Of course, the perception of what is frightening or stressful varies from person to person.

⁷⁷ Forbes et al., “Yoga Therapy in Practice,” 90.

The “fight or flight” response includes increases in heart rate, blood pressure, respiration, muscular tension (this aspect is most detrimental for musicians since muscles need to be relaxed for optimal motor control), and the release of stress hormones (cortisol). The cortex causes the body to relax and return to its normal state. Often, chronic overstimulation of the limbic system leads to heightened levels of anxiety and stress; after a while, the organism is unable to return to homeostasis and ultimately becomes exhausted and even more prone to stress, eventually leading to illness. The person in such condition feels constantly hyper-vigilant and forced to be continually “on watch.” Yoga interrupts stress response with techniques such as diaphragm breathing, tension-releasing bodily movements, and mindfulness.⁷⁸ A number of studies has shown decreases of cortisol in the blood of the participants, as well as alpha wave brain activation just after one Yoga class (alpha brain waves are associated with deep calm, and have been linked with enhanced immunity).

Yoga has also shown to balance the levels of certain neurochemicals in the brain (especially of gamma-aminobutyric acid) that have been associated with anxiety disorders and depression.⁷⁹ In his “Yoga and Psychoneuroimmunology,” Scott Blossom explains, “Yoga is designed to optimize one’s psychoneuroimmunological functioning by addressing the roots of negative unconscious conditioning and prescribing multidimensional practice for positive transformation.”⁸⁰ Blossom stresses that systematic practice of Yoga retunes the nervous system, including the limbic system and

⁷⁸ Campbell and Moore, “Yoga as Preventative and Treatment for Depression, Anxiety, and Stress,” 54.

⁷⁹ Forbes et al., “Yoga Therapy in Practice,” 88.

⁸⁰ Blossom, “Yoga and Psychoneuroimmunology,” 24.

its ways of responding to stress. It is a way of reinforcing positive, more effective behaviors, which ultimately leads to discarding old, ineffective habits. It is a way of gaining freedom to chose how one acts without being controlled by past conditioning.

CHAPTER 6

CONCLUSION

Through the evidence presented in this document, including medical studies and expert opinion from music pedagogues, physiotherapists, psychologists, and Yoga instructors, along with my personal experience, I have demonstrated that Yoga improves musicians' chances of avoiding and recovering from injury, developing optimal conditioning of the body, and fulfilling potential as performers and teachers. Thus the benefits of Yoga may be viewed from two different perspectives; as injury prevention and the enhancement of performance skills.

The problem of injured musicians can be traced back to 19th and even 18th century, as documented by medical literature that discusses various incidents of musicians suffering from playing-related conditions as well as with often cited case of Robert Schumann's right hand injury.⁸¹ The recognition of seriousness this issue presents, and the development of the field of performing arts medicine is relatively recent and still requires further advancement. Even though F. M. Alexander's pioneering work in understanding the mechanics of the body and the importance of the correct use of the body for performing artists was first published in 1932, about 50 years had to pass before his ideas received wider recognition. The awareness of the importance and correlations

⁸¹ Rogers, "Survey of Piano Instructors," 1.

between the physical condition and musical performance became more widespread in 1980's, in large degree due to publicity received by the right hand disabilities of Gary Graffmann and Leon Fleischer, and a number of surveys showing chilling statistics of musicians affected by career-threatening injuries.⁸² Three chapters of this document provide anatomical descriptions distinctively useful for violinists, an overview of a number of the most common injuries, and also specific demonstrations of the unique characteristics of various *asanas* and their value-in both preventing and battling these conditions.

As emphasized in Chapter 5, in addition to physical problems, a musician in the modern world is also confronted with extremely vital psychological challenges including performance anxiety, stress, inability to focus or negative inner dialogues during performances. Interestingly, through my investigation of Alexander's, Gallwey's, and Greene's writing, I came to the conclusion that although these three authors worked from various starting points, they all attempted to convey a very similar message; and that this message is also embedded in teachings of Yoga. The essence of this lesson is learning how to unlearn; to release harmful habits both mental and physical.

Alexander came to his conclusions by applying a scientific approach to his body and its use. Through unbiased observation he realized that his perception of the body posture and his motions was different from what was happening in reality. Alexander was able to achieve the realization that the faulty position of his head, neck and back interfered with his abilities to perform, only by being fully present in the moment,

⁸² Oestreich, "In Music as Well as Sports, Injuries can End a Career," C9; quoted in Rogers, "Survey of Piano Instructors," 1.

without any preconceptions and excessive attachment to the outcome (end-gaining). Gallwey also suggests that to find solutions to technical and mental challenges of any performance (for example to quiet negative mind chatter), one needs to put the attention into what is happening in the now. Greene advises to develop right brain thinking and using positive affirmations. He also proposes the Centering technique, again, as a way to bring oneself into the present. I believe that practice of Yoga will make one better equipped to explore all of these methods.

Furthermore, as Ted Cox, the principal tuba player with the Oklahoma City Philharmonic and Yoga instructor says, “In our culture, results get all the attention and the process is overlooked.”⁸³ Competition is an inherent part of the musician’s experience and at times such reality may be devastating both professionally and in personal life. For many of us constant judgment starts from an early age. I believe that with help of Yoga, we may overcome negative notions and make our music making much more enjoyable and creative. Yoga provides the means to help us free ourselves from dependence on the “verdict” of our judges; we come back to playing our instruments for the sake of music and our original love of it. As the authors of a recent article on Yoga therapeutics state, “the practice of Yoga can narrow the gap between insight and change.”⁸⁴ I hope that in this paper I have provided useful insights and specific techniques and exercises in order to facilitate a positive change.

⁸³ Cox, “Musical Growth Through Yoga,” 49-52.

⁸⁴ Forbes et al., “Yoga Therapy in Practice,” 87.

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APPENDIX

This appendix contains lists of poses grouped together by degree of difficulty. For detailed discussions of each exercise, see page number after the name of each pose.

1. Easy stretches and least advanced poses; good for the beginning of the Yoga session in the morning, or as relaxation during short breaks while practicing the instrument.

Especially beneficial for posture and general relaxation:

Shavasana (Corpse Pose,) p. 81.

Warm up No.1, Warm up No.2, Supta Padangusthasana (Sleeping Big Toe Pose), p. 64.

Balāsana (Child Pose), p. 52.

Tadasana (Mountain Pose), p. 25-26, 33, *Oxygen Cocktail*, p. 28, *Push-Pull*, p. 29, *Standing Twist*, p. 30, *Side Stretch*, p. 31, *Head Rolls*, p. 32.

Especially good for arms and shoulders:

Shoulder Rolls, p. 61, *Yoga Mudra*, p. 24-25, *Gomukhasana, Garudasana* (Cow Face Arms, Eagle Arms), p. 62.

The poses listed above can be done separately or as a part of routines discussed in Chapter 2 and 3.

2. Slightly more advanced poses, most beneficial when included as a part of Yoga session:

Surya Namaskara (Sun Salutations), p. 39-40, *Adho Mukha Svanasana* (Downward Dog), p. 51-52, *Padangusthasana* (Forward Bend), p. 64, *Utthita Trikonasana* (Extended Triangle), p. 65, *Parvatanasana*, p. 81, *Urdhva Dandasana* (Modified Headstand), p. 56-57.

3. Advanced poses.

Marichyasana, p. 85-86, *Halasana* (Plow Pose), p. 87, *Shirshasana* (Headstand), p. 5, *Adho Mukha Vrksasana* (Handstand), p. 87.

Always end a sequence with *Shavasana*.