MAKING THE SWITCH: A PHYSIOLOGICAL GUIDE

TO MAPPING THE TRANSITION

FROM VIOLIN TO VIOLA

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ABSTRACT

This document provides violinists with a systematic approach for a successful transition to playing the viola. The work is based on a study of intramuscular and musculoskeletal workings of the body. Because musicians are considered by many to be "small-muscle athletes," information taken from studies of sports medicine, methods for avoidance of injury, and rehabilitation techniques will be included in this discussion. This anatomical analysis sets the study apart from the other literature in this area.

Because of the structural differences between the violin and the viola, the performer must adapt to changes in the use of the entire upper body. I will focus primarily on the physiological differences with regard to the technical adaptations which the player must be aware of, while providing practical tools so that the switch from violin to viola can be made effectively and ergonomically, without injury.

I will show that by using this guide, a seamless transition can be made, no matter the shape and proportions of the instrument. The main objective is to guide the player's understanding of mapping the body and of the physical changes that affect the upper body when making this transition. It is my hope that this analysis will be a useful pedagogical tool for violinists becoming violists.

DEDICATION

This document is dedicated to my mother and father, with love. For without them, I would not have been afforded the opportunities necessary to reach this point in my musical endeavors.

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I am grateful and blessed to have this opportunity to thank the many colleagues, friends, and faculty members who have supported me throughout this endeavor. I would like to give a very special thanks to the Director of Graduate Studies, Dr. Linda Cummins, for her time, guidance, unwavering support, and her ability to always keep me focused while putting a smile on my face during the most difficult times. I would like to thank my committee chair, Professor Carlton McCreery for his support of this topic, committee members Dr. Osiris Molina for his uplifting spirit, and Dr. Jennifer Shaw, for insightful information, thought-provoking ideas, and for guidance throughout this challenging process.

I could not have made it to this point without the continued support from my family. Their own work ethic is awe-inspiring, and their belief in my abilities have given me the strength and fortitude to overcome many obstacles. This document is a testament to the faith my family has instilled in me, and for that, I cannot thank them enough.

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CHAPTER 1

INTRODUCTION

For every musician, awareness of the body and its limitations is essential. This cannot be more true for the string player. String instruments are played asymmetrically, meaning that completely different posturing and motions are required on the right and left side of the body. It is not uncommon for a violinist to pick up a viola and play it as a violinist would, using a violinist's technique, but these two instruments are not one in the same, and without studying the intricacies of both, problems can arise. For example, because of the size difference, if the viola is approached with violin technique, the left hand could become strained or injured. Additionally, pitch would certainly be problematic because of differing finger spacing required of the viola's longer string length. Shifting to upper positions can also be problematic, because getting around the shoulder of the viola requires more use of the whole arm. On the violin, one can reach near the end of the fingerboard with the thumb resting on the saddle. Technical problems such as these are not possible on the viola. On the right side, the use of the bow greatly differs in its approach when considering the execution of bow strokes and even the bow grip. If a violist approaches the bow like a violinist, the sound will lack the depth and focus necessary on the viola. Adaptations must be made for these differences in sound production.

While there is ample literature explaining the technical aspects of playing both the violin and the viola, there has been very little focus on the changes the player must consider from a physiological and technical standpoint when transitioning between the two. As young violinists

grow and develop, a number of them make the transition to the viola. Because this transition can be challenging and lead to poor technique, I wish to fill this void by examining both instruments and offering a guide to those who have made, or may make, this switch from violin to viola. It is my hope that this analysis will be a useful pedagogical tool for violinists becoming violists, so that this process can be made seamlessly, while avoiding pain and injury.

Unlike other literature, this document focuses a great deal on the human anatomy and the musculoskeletal system, because understanding how the player's body must adjust is critical to the transition from violin to viola. Overuse of the upper extremities can lead to pain, discomfort, or injury. Because being aware of the sensations of the body in motion when playing these instruments is crucial, I explore the sports-related field of performing arts medicine, as well as holistic practices for retraining the body through awareness for the techniques and strategies they offer for minimizing pain or injury. Technical considerations and simple exercises for use on the violin and then on the viola are offered and addressed. I also offer a complete examination of the proportions of the two instruments, using the averages from a number of violins, violas, and their bows.

My reasoning for choosing this direction for this document is multifaceted. Like myself, many violinists must overcome physical and technical issues when adapting to viola playing. The anatomical discussions regarding musculoskeletal and intramusular workings within the upper body will help the violinist become aware of exactly what to expect when making this transition. I have mapped the upper body, isolating muscles and muscle groups affected by playing the viola that are not as often, or as strenuously used when playing the violin. Analysis of the differences with both the right hand and arm, the left hand and arm, the chest and abdomen, and shoulders

and back, are paramount to understanding how to adapt to playing a much larger and more physically demanding instrument. This document will show violinists who play or teach the viola, that the same technical principles do not always apply to the viola as they do to the violin.

Quite often, physical and technical issues can lead to mental regression. Over the years I have encountered many violists who started on violin. The vast majority of those people met a huge stumbling block when their violin technique no longer allowed them to progress because they lacked understanding of the physiological changes necessary to play the viola properly. Because of the comfort level that the player has with the violin, the many subtle changes necessary to play the viola can lead to mental duress and frustration. Violist and Ohio State University professor Juliet White-Smith articulates the same core principle, stating that "because the violin is so familiar, the skills that create a certain consistency in intonation and tone, for instance, are second nature."[1] She believes that analyzing the many differences between the violin and the viola, while "slowing down the mental processes...is necessary in discovering and reinforcing how those same skills must be altered in the approach to a different instrument."[2] This guide provides advice on how to achieve these goals.

By using this guide as a reference for such circumstances, it is clear that if new violists consider their obstacles, become aware of them, and systematically approach them as outlined, then they will no longer struggle with the transition. At that point the violist will be able to create the rich, robust, and warm sound that the instrument has to offer.

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[1] Juliet White-Smith, "From Violin to Viola: Making the Switch a Success," *American String Teacher* 50, no. 1 (02, 2000), 60.

[2] Ibid, 60.

CHAPTER 2

THE VIOLIN VERSUS THE VIOLA

Introduction

Violas and viola bows differ greatly in proportion, size, and weight. Contrary to this, the violin has consistently maintained size and proportions since the late 16th century. The violin is commonly 14 inches in length, while the most standard modern violas range from 16 to 17 inches. While it is somewhat uncommon, today's violas may exceed 17 inches in body length. It may seem to the violinist that these differences are minute and do not greatly affect their technique. In fact, these small differences are critical.

Size, shape, and string length are the most critical factors in determining the most appropriate viola for each individual. However, the player must learn to adapt to each individual instrument, because ultimately, the sound of the instrument determines its worth to the player.

Two of the most distinguished violists, Paul Hindemith and Lionel Tertis, contributed greatly to the design of the modern viola. Both of these violists commissioned instruments combining the use of ideas from earlier makers in order to create both a desirable sound and a manageable playing technique. A shorter instrument allows for more technical facility, while the additional airspace created by broadening the shoulders, bouts, and ribs, gives the instrument the necessary depth of sound. Ideally, this is the coalescence of concepts which every violist must seek; both the technical facility of the violin, and the richness of the violoncello. Tertis wrote that

his 1937 model "is simply an amalgamation of all the good points of the old masters in the many instruments I have seen, heard and played, plus anything I have learned that makes for ease in manipulating the larger dimension of viola."[3] Both the 'Sprenger model' of 1930, used by Paul Hindemith, and the 'Tertis model' of 1937, are the two most commonly used templates for the modern viola, and fall within the 16 to 17 inch range.[4]

Size, Weight, and Proportions of Today's Violas

In order to have a complete understanding of the differences between the violin and the viola, I took a series of measurements using instruments that fall within the standard body lengths of both instruments, respectively. Additional measurements also compare viola and violin bows, again as a precursor to the later discussion regarding physical accommodations the player must consider when transitioning from violin to viola.

To be as comprehensive as possible, I examine the following: the length of the body, the string length, the length of the fingerboard, the width at the end of the fingerboard, the width of the shoulders, the width of the middle and lower bouts, the height of the ribs, the width of the bridge, the distance separating the strings, the height of the strings, the distance from the end of the tailpiece to the bridge, and the overall weight of the instrument. The body length and string length of the viola are the two most important criteria when considering the size of the

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[3] Robert Dolejsi, "What Size Viola?," *Violins and Violinists* (December, 1943), 1.

[4] David D. Boyden and Ann M. Woodward, "Viola," Grove Music Online, Oxford Music Online, Oxford University Press, accessed February 22, 2014.

instrument. With regards to the bow, I noted: the weight of the bow, the length of the bow, the size of the frog, and the girth of the stick. Figure 2.1 outlines the average measurements taken from 10 different professional to student level violins, violas and their bows, respectively. Each of these measurements was taken at a string instrument retailer.

Figure 2.1 Average Proportions of 10 Different Violins,Violas, and Bows

Common Measurements	Violin	Viola
Body length	14 inches	16.4 inches
Rib height	1.25 inches	1.5 inches
Shoulder width	6.6 inches	8 inches
Middle bout width	4.4 inches	5.7 inches
Lower bout width	8.2 inches	9.9 inches
Saddle to bridge	6.6 inches	7.7 inches
Width of edge of fingerboard	1.4 inches	2 inches
String width at bridge	1.4 inches	1.6 inches
String height from edge of fingerboard	6 mm	8 mm
Length of fingerboard	10.8 inches	12.6 inches
Instrument weight	15.36 ounces	21.71 ounces
String length	13 inches	15.1 inches

Common Measurements	Violin bow	Viola bow
Weight	60.1 grams	69.3 grams
Length	74 cm	74.3 cm
Stick girth	2.7 cm	3 cm

Common Measurements	Violin bow	Viola bow
Frog length, width, height	1.7 in, 0.4 in, 0.9 in	1.9 in, 0.5in, 0.7 in

The Varying Shapes and Styles of the Contemporary Viola

Luthiers, in particular those who specialize in building violas, have continued pushing the envelope in order to create instruments that can be played more effortlessly, without negatively altering the sound. Today, for example, there are many modern violas without right shoulders, with non-traditional curvature, and concave, rather than traditional convex ribs at the base of the instrument. All of this designed in order to aid the musician's technical facility while avoiding injury. Even completely asymmetrical violas have been created with ease of playing in mind. David Rivinus' '*Pellegrina*' instrument is an excellent example of a modern, asymmetrical viola.

Figure 2.2 The '*Pellegrina*' viola[5] (permission granted by David Rivinus)

Figure 2.3 Viola made by Hiroshi Iizuka (permission granted by Hiroshi Iizuka)

[5] ---. Rivinus- Instruments, http://www.rivinus-instruments.com, accessed September 23, 2012, 1.

Even the great violist and pedagogue William Primrose believed that violists should play more traditionally shaped instruments and avoid the new and *en vogue* viola, because the sound of the instrument could be greatly altered, and the focus should be on the instrument length, as well as the string length. The violist should "avoid the oddball models that have been offered from time to time,"[6] because changing the proportions affects the sound. He also adds that when a smaller viola may be necessary, the violist should "seek instruments of the widest dimensions and with deep ribs. These departures from the norm sometimes make up for the shorter linear dimension."[7] In a 1943 article, Primrose states that "I adjure violists to seek instruments like Guarneri's, with a wider middle bout. With that dimension up to seventeen inches I deem practical."[8] His advise to the violist is important because, no matter the dimensions of the viola, there will still be technical obstacles and sound production issues to overcome.

The focus of this chapter was to identify the differences in the size, weight, and proportions of the violin versus the viola, that affect the transitioning player's tone, pitch, technique, and posture. This gives the transitioning violinist the knowledge to understand the many subtle adjustments that are necessary when approaching the viola. String length, size, and shape, are the most critical factors when determining the best viola for the player. Violas, similar to those pioneered by Tertis and Hindemith, with widened bouts and taller ribs, will give the violist the best tone production.

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[6] Robert Dolejsi, "What Size Viola?," 1.

[7] Ibid.

[8] Ibid.

CHAPTER 3

USE OF THE UPPER BODY AND ITS EXTREMITIES

Introduction

How violinists and violists utilize their upper body determines not only their effectiveness on their instrument, but also the sustained longevity of their career and avoidance of injury. It is imperative that violinists transitioning to the viola study the anatomy and the physiology of the human body in order to properly train their bodies, as well as understand how body mechanics function. One way to achieve this goal is to take a holistic approach to body awareness and body mapping techniques. A second area of expertise on which to draw is the field of performing arts medicine which has developed a better understanding of how our musculoskeletal groups function when playing an instrument.

If the violist does not adapt to the size, weight, shape, and string length of the instrument, as well as the bow, he or she can suffer discomfort and potential injury. The greater length of the instrument can cause strain of the left shoulder and arm, whereas the longer string length, which leads to wider left hand spacing, can lead to an overuse injury. Because the viola has broader shoulders, the elbow and hand of the violist must come further around the instrument, and the additional weight increases downward force on the shoulder. The size and weight of the bow, and the technical differences in how the bow is used on the viola versus the violin, can also lead to discomfort and pain. Beginning violists often experience the overexertion of muscles of the upper body, including those from the trapezius of the neck to the deltoid of the shoulder, and from the biceps brachii to the muscles of the forearms and hands. Similarly, tendons, ligaments,

and the nervous system, can suffer trauma. Being unaware of the new technical obstacles on the viola can lead from minor pain and discomfort to more serious injuries.

Because the violin and viola require asymmetrical postures, it is necessary for one to fully understand that the biomechanics on one side of the body differ from the other. A study by physiotherapist Cecilia Wahlström Edling showed that asymmetrical musicians like violinists and violists "had a significantly greater amount of neck, shoulder, and back disorders."[9] Kinesthetic awareness is needed to execute either the violin or the viola properly, but an even heightened sense of touch is paramount when making the transition from one to the other.

By fully understanding biomechanics, it is apparent that some degree of tension is inherent within any physical task, but what is more important to understand is that the release of that tension is necessary. Muscles in the upper extremities work together as a team, rather than independently of one another. For example, as one muscle contracts, the opposing muscle releases tension, and vice versa. The contracting muscle is known as the agonist, while the antagonist muscle is relaxed. Repetitive actions like the back-and-forth motions of the bow, as well as *vibrato* and shifting are examples of muscles working together. The majority of muscles used when playing the violin and viola operate in this pattern.[10]

In the following chapter, I examine each region of the upper body individually, with a focus on the most used musculoskeletal groups, those that are the most often injured, and an explanation of why this occurs. The main objective of this chapter is to define the intramuscular

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[9] Cecilia Wahlström Edling, "Musculoskeletal Disorders and Asymmetric Playing Postures of the Upper Extremity and Back in Music Teachers: A Pilot Study," *Medical Problems of Performing Artists* 24, no. 3 (09, 2009), 113.

[10] Jennifer Wales, "Three-Dimensional Movement and Muscle Activity Patterns in a Violin Bowing Task" (PhD diss., Brock University, 2007), 12.

workings of the upper body, so if discomfort, pain, or an injury does arise, one can use sensory perception to first isolate the issue, and then alleviate the problem using practices discussed in chapter four. Images of the musculoskeletal groups can be found and referenced in Appendix 1.

The Left Hand and Arm and Injuries

For violinists and violists, the left hand and arm carry a great physical workload. Because of weight, size, and proportions, the viola is the more demanding of the two instruments. Studies using electromyography, and two-dimensional and three-dimensional video-graphic analysis, offer conclusive identification of regions of the musculoskeletal system that are most active, passive, or postural.[11] Today's research combines the use of electromyography, or EMG, and motion analysis, which gives musicians a more comprehensive analysis of their muscles and joints.[12] Electromyography is used to measure the electrical activity within a muscle, both while resting and in motion.[13] The use of electromyography and video-graphic analysis indicate that the biceps brachii in the left arm is "the principal muscle being used while playing as it facilitates and sustains supination and flexion of the elbow. The left arm is abducted and externally rotated,

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[11] Susan Elaine Ross, "Electromyographic and Videographic Analysis of Two Left Upper Extremity Support Methods in Violin Or Viola Players" (DMA diss., University of Northern Colorado, 1998), 1-5.

[12] Jennifer Wales, "Three-Dimensional Movement and Muscle Activity Patterns in a Violin Bowing Task," 8.

[13] Ibid.

and the left forearm is supinated."[14] In other words, the left forearm is turned inward so that the palm of the hand is parallel to the neck of the instrument, while bringing the elbow under the instrument. The left biceps brachii is vital to the motions of vibrato and shifting, which is documented by EMG and video-graphic analysis.[15] Physiological studies by Otto Szende and Mihaly Nemessuri also concluded that the left triceps brachii "acts antagonistically" to the biceps brachii, to stabilize and posture the elbow. Because of the constant involvement of the biceps brachii, injuries such as cubital tunnel syndrome and tendonitis of the elbow are common amongst violists.[16]

In 1989, performing arts physicians F.J. Bejjani, L. Ferrara and L. Pavlidis used electromyography to analyze a violinist's vibrato and discovered that the "left biceps brachii, flexor digitorum, extensor digitorum, and pronator teres, come on and off in a periodic fashion, while the deltoid is constantly active."[17] This means that these muscles act as agonists and shift back-and-forth with their antagonist muscles. According to studies by physician Jennifer Wales, controlling the fingering and shifting movement in the fingers, wrist, and forearm requires use of the flexor and extensor muscles.[18] Additional studies using electromyography and video-graphic analysis by Susan Elaine Ross indicate that because the aforementioned muscles are active when

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[14] Jennifer Wales, "Three-Dimensional Movement and Muscle Activity Patterns in a Violin Bowing Task," 12.

[15] Ibid.

[16] Shao-Chin Chien, "Application of the principles of the Alexander Technique to viola playing and performance" (DMA diss., University of Miami, 2007), 8-10.

[17] Jennifer Wales, "Three-Dimensional Movement and Muscle Activity Patterns in a Violin Bowing Task," 12.

[18] Ibid.

vibrating, that a number of injuries can be caused by poor technique.[19] Amongst those are shoulder impingement from overuse of the deltoid, tendonitis of the elbow, as well as tendonitis of the left hand, carpal tunnel syndrome of the left wrist, and trigger finger, caused by tension in the left hand.[20]

Cecilia Wahlström Edling found that musicians such as violinists and violists "who played with the arms lifted more than 40° reported greater neck/shoulder disorders than those who played with a more neutral arm position,"[21] like that of the violoncello and double bass. In Figure 3.1, one can see that the level of the arm is raised greater than 40 degrees, supporting the evidence that musicians, such as violinists and violists, are at the most risk for injuries of the upper extremities.

Figure 3.1 Elevated left arm position (image taken by author)

[19] Susan Elaine Ross, "Electromyographic and Videographic Analysis of Two Left Upper Extremity Support Methods in Violin or Viola Players," 57-61.

[20] Shao-Chin Chien, "Application of the principles of the Alexander Technique to viola playing and performance," 8-10.

[21] Cecilia Wahlström Edling, "Musculoskeletal Disorders and Asymmetric Playing Postures of the Upper Extremity and Back in Music Teachers: A Pilot Study," 113-118.

Wales also concluded that the constant workload from posturing with an elevated left arm "leads to a high intramuscular pressure in the muscle bellies in the shoulder muscles. A high intramuscular pressure causes reduced local blood flow in the muscles, which also affects the circulation in the muscle tendons, since blood perfusion in the tendon originates partly from the muscle."[22] Reduced blood flow in the muscles and tendons could lead to aches, pains, and ultimately, degeneration.[23]

The Left Shoulder, Upper Back and Injuries

The large muscle that runs along the back of the shoulder, and up to the side and back of the neck, is the trapezius. This muscle, and the deltoid of the shoulder, are the primary muscles used when holding both the violin and the viola.[24] Often this muscle is overwhelmed with tension because of poor technique in which the head and shoulder compress the instrument and hold it in place.

Violist Shao-Chin Chien's studies found that the left trapezius muscle requires a constant load.[25] This is due to the instrument resting on the muscle, the head resting on the instrument, and the downward force created by the instrument's weight and the use of the bow. This may be

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[22] Jennifer Wales, "Three-Dimensional Movement and Muscle Activity Patterns in a Violin Bowing Task," 12.

[23] Ibid.

[24] Ibid, 10-11.

[25] Shao-Chin Chien. "Application of the principles of the Alexander Technique to viola playing and performance," 7.

because those experiencing pain hold the muscle in place, while those who do not suffer from pain in the trapezius, have much more active use and freedom of the muscle.

In addition to the trapezius, the other "left shoulder muscles, particularly the anterior deltoid, are used to support the raised left arm."[26] Overuse of the deltoid and the shoulder muscles can lead to pain, discomfort, swelling, and even shoulder impingement syndrome. The instrument is supported "in the left supraclavicular fossa,"[27] while the head is slightly rotated to the left, which puts the neck in a "position of left lateral flexion."[28] One should, therefore, pay particular attention to not turn, or over-rotate the neck. However, holding the neck in a fixed position for extended periods of time can lead to nerve entrapment, muscle strain, and severe pain.

The Right Upper Body and Injuries

The right side of the upper body works in a completely different fashion from the left. The primary muscle used in the facility of the bowing motion is the trapezius, but it works much differently from the left. This muscle is constantly in motion as the bow travels. Overuse or misuse of the trapezius can result in pain, but studies show that the left trapezius is more often

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[26] Jennifer Wales, "Three-Dimensional Movement and Muscle Activity Patterns in a Violin Bowing Task," 10-11.

[27] Ibid, 9.

[28] Ibid.

injured than the right.[29] However, if the right trapezius is held in position, or locked, it can lead to nerve entrapment in the neck, unilateral cervical pain, and muscle strain. In addition to the trapezius, the right deltoid and right biceps brachii are among the most active muscles in the right arm. Injuries common to overuse of the right deltoid include shoulder bursitis, shoulder impingement, and tendonitis of the rotator cuff.[30]

The right biceps brachii is active in both down-bow and up-bow motions, whereas its antagonist muscle, the triceps brachii is the least used. These muscles have "the greatest muscle activity when the shoulder is horizontally abducted and flexed at the beginning of a down-bow, especially at low speeds."[31] Since the viola requires a slower, more gradual pull of the bow, this indicates that the viola is more physically demanding with regards to the use of the bow arm. The triceps brachii is also much more active on an up-bow, as is the right deltoid. This is because of the upward force needed to counteract gravity. Playing on the lower strings on both the violin and viola causes the greatest amount of activity in the deltoid. As one moves to the upper strings, the use of the deltoid drastically decreases. Studies also indicate that the biceps brachii is most active when using the elbow as it flexes.[32] This is common when utilizing the lower half of the bow. When moving to the upper half of the bow, the right shoulder is "internally rotated and abducted, and the forearm is pronated."[33] With smaller bow strokes, and when making bow

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[29] Shao-Chin Chien. "Application of the principles of the Alexander Technique to viola playing and performance," 8.

[30] Ibid.

[31] Jennifer Wales, "Three-Dimensional Movement and Muscle Activity Patterns in a Violin Bowing Task," 9.

[32] Ibid.

[33] Ibid.

changes, the “flexors and extensors in the right forearm are used to control the bow.”[34] It is common that overuse of the flexors, extensors, and biceps brachii cause pain, but also lead to tendon and ligament issues, such as tendonitis, nerve entrapment, and cubital tunnel syndrome. Muscle twitching, or fasciculations are also common amongst violinists and violists that overuse these muscles.[35]

Although fine motor movement is utilized in the wrist, the right hand is rarely as injured as the left, which is is due to contorted positioning and overuse of the left hand. The most common right hand injuries include carpal tunnel syndrome, and tendonitis.[36] Other common injuries involving the right thumb are de Quervain's tenosynovitis, and trigger finger (thumb).[37] Often times, the reason for right hand injury is squeezing and locking the thumb.

The Chest and Abdomen

Although the chest and the abdomen are rarely injured from performance, they are integral to the free and proper use of the upper body. If used in the right way, the chest and abdomen can help facilitate freedom throughout the rest of the upper body.[38] And because the

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[34] Ibid, 10-11.

[35] Shao-Chin Chien. "Application of the principles of the Alexander Technique to viola playing and performance," 8-10.

[36] Ibid.

[37] Ibid.

[38] Matthew Anderson Dane, "Coordinated Effort: A Study of Karen Tuttle's Influence on Modern Viola Teaching" (DMA diss., Rice University, 2002), 35.

chest connects to the shoulders and arms, good alignment with the chest can allow for better blood flow and increased flexibility in the extremities.[39] Being aware of breathing can help facilitate more openness within the chest, and a more relaxed state in the abdomen. Together this reduces the chance of injury elsewhere.

With broadened shoulders, one should be aware of keeping the chest as open as possible. This will not only free one's playing, but help avoid injuries such as thoracic outlet syndrome, or shoulder impingement. As many pedagogues state, the abdomen should be relaxed. For example, Karen Tuttle believes that the belly should be soft.[40] This large muscle group can create upward tension throughout the body when flexed, and this should be avoided. Additionally, not contracting the muscles of the abdomen can aid the chest and shoulders by allowing for outward physical freedom, as the abdomen, when flexed, can pull the shoulders and chest inward.

In conclusion, it is important to be fully aware of how our bodies function when playing the violin and viola. Consider that because of the bigger, heavier viola, and bow, that violist is more often injured than the violinist. Constant analysis of the body through awareness and observation is necessary to making a successful transition from the violin to the viola, while building muscle memory, and sustaining a career without injury.

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[39] Ibid.

[40] Ibid.

CHAPTER 4

AWARENESS TECHNIQUES & SPORTS MEDICINE

Introduction

The following chapter will focus on body awareness and body mapping techniques, that heighten kinesthetic sense and muscle memory, while avoiding injury. The transitioning player can adapt by studying these ideas and putting them to use, once he or she has a clear understanding of the biomechanics involved in playing the viola. This chapter will also include information on therapeutic solutions to facilitate relaxation while avoiding unnecessary tension. The topics to be discussed include musicians as athletes, and the statistics of injured musicians, particularly violinists and violists. The development of performing arts medicine, which is heavily rooted in the principles of sports medicine, is integral to how we understand the body and avoid pain and misuse. Alexander Technique, *tai chi*, *yoga*, and the Feldenkrais Method will be examined to further the ideas of body awareness and biofeedback techniques.

It is my goal that the transitioning player explore and study the principles of these techniques in order to become more physically aware while making the transition from the violin to the viola. This discussion also informs the player how to gain physical freedom and fluidity of movement. Relaxation, and the release of tension are crucial when approaching the viola.

"Small Muscle Athletes"

Athletes and musicians have a lot in common. An athlete's training can include building strength, agility, endurance, and speed. Like musicians, athletes are trained to execute particular motions, or a series of motions in a repetitive manner. For example, consider the throwing motion of a baseball pitcher, or an American football quarterback: these tasks are highly repetitive and success is largely based on mastering what would be considered proper technique. The same theory applies to someone batting a baseball, swinging a golf club, or shooting a basketball. Professional athletes may train large muscle groups of the body in order to be exceptional at his or her sport. While musicians do not often train large muscle groups in order to play their instruments, they do train some of the smallest and most seldom used muscles in the upper body and its extremities. Because the repetitive motions done while playing musical instruments use so many small muscle groups, we, as musicians can be looked at as small muscle athletes.

In an interview Pat Samples conducted with Dr. Richard Lederman, the director of the Musical Centre for Performing Arts at the Cleveland Clinic, he explained that although athletes are taught the importance of conditioning through physical education, there is not any sort of comparable education for musicians.[41] He goes on to explain that musicians and athletes have slight differences in how their careers are approached. Like Tara Banick, a physical therapist and head of the Illinois Bone and Joint Institute, Lederman points out that musicians typically start their training at a very young age, which can affect the young musician's physical development.

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[41] Pat Samples, "Music's Easy on Ears, Hard on Muscles; Playing Poses Little-Known Risks to the Fingers, Eyes and Neck," *The Gazette* (Sep 06, 1989), D7.

Additionally, musicians have very long, sustained careers, whereas, athletes typically have short careers.[42]

Most athletes have a performance season of several months followed by rest and conditioning, while musicians often perform year round, with very little time for the body to rest.[43] Banick agrees with Lederman's assessment when she points out that "all too often, however, musicians' pain is overlooked because they are not considered "athletic" injuries."[44] Remember that vigorous practice regimens coupled with a young, developing body, can take a physical toll on the player.[45] Banick also reminds us that "factors like the demands of a specific instrument, the amount of time spent practicing, playing posture, and the level of musicianship can also increase the risk of injury."[46] Poor posture and lack of body awareness also contribute to pain and discomfort.

While a vast number of musicians deal with overuse injuries during the course of their musical careers, statistics indicate that the string family includes the two most oft-injured instrumentalists, those who play the viola and the violin. Indeed, the majority of viola players will suffer at least one injury over the course of their careers.[47] Musicians should learn from

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[42] Pat Samples, "Music's Easy on Ears, Hard on Muscles; Playing Poses Little-Known Risks to the Fingers, Eyes and Neck," D7.

[43] Ibid.

[44] Tara Banick, "Musicians Are Athletes, Too!" *Illinois Bone & Joint Institute* (2013), 1.

[45] Ibid.

[46] Ibid.

[47] Jenny I. Ro, "Risk Factors for Musculoskeletal Disorders among Performing Musicians" (PhD diss., University of Massachusetts Lowell, 2006), 12.

athletes that rest and proper conditioning, coupled with proper technique and physical awareness, can lead to a more successful and sustained career.

Injuries and Statistics

In the last 30 years, there has been significant interest in music-related injuries. While the medical field has greatly evolved during that time, it is important to know that studies regarding musculoskeletal injuries amongst musicians have been consistent in regards to the types of injuries, and which instrumentalists suffer the most. The most common injuries include those related to overuse of the upper extremities, such as tendonitis and carpal tunnel syndrome, nerve entrapment, shoulder impingement, bursitis, neck pain, cubital tunnel syndrome, tendonitis, de Quervain's tenosynovitis, thoracic outlet syndrome, trigger finger/thumb, and TMJ dysfunction.[48]

In this section I will provide evidence of these musculoskeletal injuries by collecting data from medical research. In a 2003 study, Alice Brandfonbrener, director of the Medical Program for Performing artists in Chicago, "found that upper-strings had the highest values for biomechanical factors and were the instrument group most strongly associated with presence of symptoms."[49] The primary focus is the occurrence of injuries amongst string players, and particularly those who play violin and viola, respectively. The following chart uses various studies to determine the occurrence of playing-related injuries amongst string players, and shows the likelihood of a string player suffering an injury during their career. An average taken from

[48] Ibid, 164.

[49] Ibid, 14.

these studies indicates that eighty percent of string players will suffer damage to the upper extremities.

Figure 4.1 Occurrence of Injury in the String Family (%)[50]

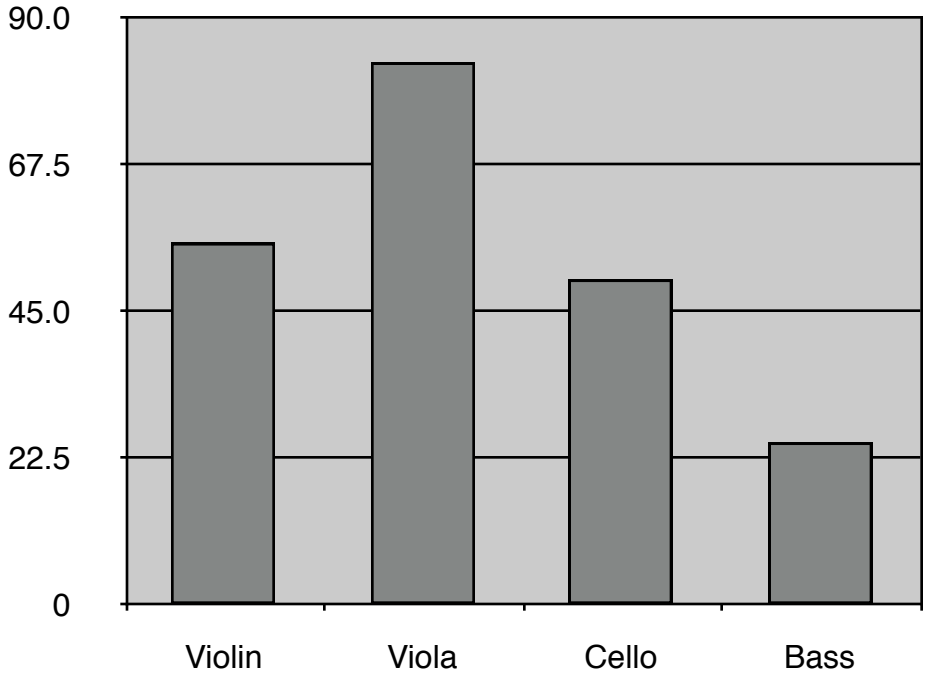
Research	Injuries (%)
Roset-Llobet et al. (2000)	77.9
Sung et al. (2000)	79.6
Guptill et al. (2000)	87.7
Koh et al. (2006)	73.4
Abreu-Ramos & Micheo (2007)	81.3

In a study of orchestral string players, F.L. Kuo found that violists have the most common occurrence of injury, followed by violinists, then cellists, and finally, bassists. The following chart realizes her findings. These statistics are crucial to this study, because the serve as proof that even though violinists are likely to deal with an injury during their career, that the additional

[50] Han-Sung Lee, Ho Youn Park, Jun O Yoon, Jin Sam Kim, Jae Myeung Chun, Iman W. Aminata, Won-Joon Cho, In-Ho Jeon, "Musicians' Medicine: Musculoskeletal Problems in String Players," *Clinics in Orthopedic Surgery*, Vol. 5, no. 3 (September, 2013), 155-160.

weight, size and proportions of the viola, cause even more physical strain on the upper extremities.

Figure 4.2 Evidence of Injuries Amongst String Players[51]



[51] F. L. Kuo, "Holistic Health and the Prevention of Performance-Related Musculoskeletal Disorders in Orchestral String Musicians" (PhD diss., University of Toronto), 2012, 46.

Performing Arts Medicine

Stemming from the principles of sports medicine, performing arts medicine has become a way for musicians to further understand the biomechanics of their playing. Medical facilities for evaluation and rehabilitation of musicians are becoming more widespread, and technology has become more advanced in recent years due to the need for specialists in medicine for the performing arts. For example, the use of three-dimensional video-graphic analysis and electromyography "when evaluating movement can help to determine the most active muscle groups during specific activities, and to discover which muscles have the greater risk of pain or fatigue."[52] While sports medicine often requires long-term reconstructive surgeries like that of the knee ligaments, the rotator cuff, and Tommy John Surgery of the elbow, performing arts medicine all but attempts to eliminate the idea of a surgical procedure, because for most professional musicians, being unable to play their instrument for an extended duration greatly affects their livelihood. Without the ability to perform, one may not be able to make a living as an instrumentalist while recovering from a surgical procedure. This is why physicians, notably ones who have, or do play instruments, are interested in the rehabilitative nature of sports-related medicine.

Medicine for performing artists came into existence in the 1980's largely because of the injuries to well-known pianists Gary Graffinan and Leon Fleisher. Both suffer from focal dystonia, which was originally thought to be caused by overuse of the hands and arms, but more recently, scientists have found it to be neurological. Very simply put, these pianists could no

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[52] Jennifer Wales, "Three-Dimensional Movement and Muscle Activity Patterns in a Violin Bowing Task," 15.

longer control their hands and arms, and in the case of Graffinan, this led to his retirement. Fleisher, however, still actively teaches and performs, and until recently was only playing works written for the left hand.[53] However, after medical breakthroughs, Fleisher has retrained his right hand and arm. His therapy involves the use of Botox, and is the only current treatment for focal dystonia.[54]

The prominence of these two pianists spawned a new branch of musician-related medicine, and today clinics, hospitals, and research facilities are growing as the understanding of a musician's physiology has become something of interest within the medical field. An example of this is the Miller Health Care Institute for Performing Artists of St. Luke's in New York. Within this medical facility is a room for evaluation of the performing artists's performance.[55] The room is complete with everything a performing artist would need to replicate the professional environment, "complete with piano, mirrored walls, rehearsal barre, even a "sprung" floor."[56] Additionally, the room has extensive technology for both the physician and patient to address the cause of the problem. As evidence that performing arts medicine stems from sports medicine, Dr. Emil Pascarelli, the institute's medical director says that performing arts

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[53] Kristin Jane Mozeiko, "The Effects of Participation in the Alexander Technique on Female Violinists and Violists: A Mixed-Methods Study" (DMA diss., Boston University, 2011), 4.

[54] National Institute of Neurological Disorders and Stroke. "*What is dystonia?*" http://www.ninds.nih.gov/disorders/dystonias/detail_dystonias.htm, accessed April 27, 2014, 1.

[55] Barbara Isenberg, "Interest in Arts Medicine Swelling to Crescendo Ailing Musicians, Dancers and Actors are Seeking Help at Specialized Clinics," *Los Angeles Times* (January 04, 1987), 1.

[56] Ibid.

physicians “look at how violinists hold violins the same way (our colleagues) evaluate the golfer's swing and the batter's stance."[57]

Performing arts medicine uses a number of varying techniques in order to further analyze the motions of the performer, while isolating areas of pain and discomfort. Unlike many medical practices, performing arts medicine for instrumentalists focuses on playing their instruments as part of the sessions. The use of video, electromyography, and three-dimensional motion analysis are amongst the most common ways that physicians are able to pinpoint injuries with musicians.[58]

Body Awareness and Injury

While there are a number of differing disciplines or techniques that may be useful to musicians, the main objective of each is being aware of the body. Body awareness, or a heightened sense of the body and somatic movement, body mapping, and muscle memory are integral to the discussion of these disciplines. When approaching a piece of music, “musicians continually gauge their sensory systems,”[59] but when a musician does not maintain a heightened sense of physical awareness and muscle memory, there is potential for injury.[60] Body mapping, as incorporated into Alexander technique, for example, teaches a conscious reeducation of the

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[57] Ibid.

[58] Jennifer Wales, "Three-Dimensional Movement and Muscle Activity Patterns in a Violin Bowing Task," 15.

[59] Kristin Jane Mozeiko, "The Effects of Participation in the Alexander Technique on Female Violinists and Violists: A Mixed-Methods Study," 9.

[60] Ibid.

motions of the body, correcting habits in order to be more efficient and coordinated.[61] The body map itself, consists of a mental representation of the body, and the sensation that knowing what the body is doing greatly enhances relaxation.[62] The awareness required to map one's body allows the musician to be physically free, and to enhance the kinesthetic sense. The sense of touch is of great importance when playing the violin and the viola, because muscle memory allows the body to be conditioned to the point that our muscles remember how to consistently execute repetitive motions. In this portion of this chapter, four techniques will be briefly explored as a means of finding the player's own regimen for relaxation, awareness, and rehabilitation. Bear in mind that using a combination of several disciplines may be most therapeutic for certain individuals. While there are numerous other techniques that could be considered useful, I have chosen those which I have found to be the most well-suited for musicians, particularly violinists and violists, because they involve physical freedom, a heightened sense of body awareness, and the kinesthetic approach to muscle memory. The disciplines discussed are *tai chi*, *yoga*, Alexander Technique, and The Feldenkrais Method.

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[61] Shao-Chin Chien. "Application of the principles of the Alexander Technique to viola playing and performance," 2-3.

[62] David Nesmith, "What Every Musician Needs to Know About the Body," http://bodymap.org, accessed April 27, 2014.

Tai chi

T'ai chi ch'uan is an ancient Chinese martial arts discipline that was originally rooted in self-defense.[63] However, the free-flowing and graceful movements of this practice have been used by many people seeking a greater sense of awareness and a reduction of stress. It is also highly regarded for its therapeutic and rehabilitative results. Most often people describe *tai chi* as "meditation in motion,"[64] while promoting "serenity through gentle, flowing movements."[65] *Tai chi* involves a string of connected movements executed slowly, and each posture flows directly into the next without pause, maintaining constant motion. Deep, controlled breathing also accompanies *tai chi* exercises. *Tai chi* can be beneficial to musicians because these exercises enhance physical awareness, most specifically providing a heightened sense of the kinesthetic movements of the body.

A number of musicians practice the art of *tai chi*, and music schools are now offering courses in *tai chi* for musicians as a means to become aware of the body, as well as to address pain, injury, and tension. By using *tai chi*, "musicians are tuned into a kinesthetic style of learning, and they are familiar with the complex and dynamic process of learning new skills."[66]

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[63] The Mayo Clinic, "Tai chi: A gentle way to fight stress" *The Mayo Clinic* (September 28, 2012), 1.

[64] Ibid.

[65] Ibid.

[66] Ibid.

Mayo Clinic specialists, Wayne and Fuerst, believe there are direct correlations between musicians and *tai chi*, which includes letting go of tension, while having emotional, mental, and physical balance.[67]

Today, *tai chi* is offered as part of the curriculum at the Blair School of Music at Vanderbilt University, and is taught by guitarist and professor, Joe Rea Phillips. Phillips is very aware that many musicians suffer from varying repetitive stress disorders, and he believes that, as a practitioner of *tai chi*, he can aid musicians by helping to relieve pain and avoid injury. When Phillips presented the curriculum to the university committee it was unanimously accepted, and he has taught "Tai Chi for Musicians" ever since.[68]

There are numerous music and performing arts institutions that offer credit hours for the study of *tai chi*. Some of those institutions include Syracuse University, Webster Conservatory, Southern Methodist University, and Southern Illinois University.[69] Additionally, clinics have been offered at many of the major conservatories, including Juilliard and the Manhattan School of Music. Although Phillips knows that *tai chi* and music are two differing art forms, he also realizes the similarities between the two in terms of one's movement, connection of motions, posture, relaxation, centeredness, and balance.[70]

According to the Harvard Medical School's Guide to Tai Chi, "you can learn to tune into your body and know what that means."[71] Ultimately, a discipline such as *tai chi* may be a useful

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[67] Ibid.

[68] Violet Li, "Tai Chi for Musicians," *The Examiner* (February 6, 2011), 1.

[69] Ibid.

[70] Ibid.

[71] Peter M. Wayne and Mark L. Fuerst, *The Harvard Medical School Guide to Tai Chi: 12 Weeks to a Healthy Body, Strong Heart, and Sharp Mind* (Shambhala Publications, June, 2013), 254.

tool to the violinist transitioning to the viola, because of the necessary free-flowing motions of the upper extremities, and the heightened sense of body awareness it can create.

Yoga

Holistic health specialists, Kuo and Khalsa, believe that *yoga* can be extremely beneficial to musicians, and its techniques have become more and more accessible to the mainstream public in recent years.[72] *Yoga* is another ancient eastern holistic practice of meditative nature, where poses, postures and stretches, have "often been used effectively for stress management and musculoskeletal disorders."[73] With religious roots in Buddhism and Hinduism, *yoga* has, for many years been a solution for musicians struggling with pain and injury. Kuo and Khalsa suggest that "the practice of yoga incorporates breathing techniques, physical postures (intended to increase strength and flexibility), as well as the practice of meditation."[74]

Amongst the most striking evidence of *yoga's* rehabilitative nature as it pertains to violinists and violists, revolves around the great violinist Yehudi Menuhin. It is widely known that Menuhin suffered a great deal from chronic and severe muscle pain.[75] Searching for a solution to his ailments, Menuhin turned to the *gurus* of *yoga* in the 1950's. Menuhin recognized

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[72] F. L. Kuo, "Holistic Health and the Prevention of Performance-Related Musculoskeletal Disorders in Orchestral String Musicians," 25-26.

[73] Ibid.

[74] Ibid., 26.

[75] Kofi Busia, "BKS Iyengar: Biography of his Guruji, The Maestro and the Queen," (2010), 1.

the benefits of *yoga* and turned to *yogacharya* B.K.S. Iyengar for relief.[76] Iyengar, founder of his own unique brand of *yoga*, known as Iyengar Yoga, is considered amongst the most influential *yoga* masterminds.[77] With "regular study and practice of Iyengar's yoga postures, Menuhin achieved a complete disappearance of his chronic, severe muscular pain,"[78] serving as proof that *yoga* can be beneficial to violinists and violists.

Alexander Technique

One of the most frequently practiced disciplines used amongst musicians is Alexander Technique. Pioneered by Australian actor and orator Frederick Matthias Alexander, this technique was designed as a means of self-observation. Alexander wanted to understand why he was losing his voice. What he discovered after traditional medicine failed, was that the "habitual patterns of movement and tension that he believed were creating interference in his breathing, speaking and acting" was the source of his vocal injury[79]. After becoming aware of the cause of the loss of his voice, he began a process of retraining and reeducating his body in order to maximize efficiency and minimize tension. His realization was that we must be aware and conscious of our habits in order to reorganize our neuromuscular systems. Systematically,

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[76] Ibid.

[77] Ibid.

[78] F. L. Kuo, "Holistic Health and the Prevention of Performance-Related Musculoskeletal Disorders in Orchestral String Musicians," 26.

[79] Kristin Jane Mozeiko, "The Effects of Participation in the Alexander Technique on Female Violinists and Violists: A Mixed-Methods Study," 15.

Alexander "explained that performance of muscular action is guided by conscious control and the four essential stages."[80] These four stages are, in succession, conceptualizing the required movement, consciously erasing the erroneous tasks created by bad habits, engaging a new mental process to correct the issue, and using the new mental approach to correct the physical issue.[81]

Shao-Chin Chien provides clear discourse in the applied principles of Alexander Technique on the viola, while citing that many overuse and misuse injuries are common amongst violists. In her 2007 document, she states that after studying the benefits of Alexander Technique and incorporating them into "traditional viola pedagogy, a new branch of viola pedagogy will be created to apply methods that will minimize physical stress and injury in viola playing."[82] At the core, the principles learned from Alexander Technique will enable the violist to be physically aware, free, and able to avoid pain, damage, and injury.

The Feldenkrais Method

Developed by Moshe Feldenkrais, an athlete and scientist, the Feldenkrais Method is another technique in which the issues of movement and ability are improved due to the acquisition of efficiency and simplicity.[83] Feldenkrais, a student of Alexander, developed his

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[80] Ibid.

[81] Kristin Jane Mozeiko, "The Effects of Participation in the Alexander Technique on Female Violinists and Violists: A Mixed-Methods Study," 15.

[82] Shao-Chin Chien,, "Application of the principles of the Alexander Technique to viola playing and performance," 7.

[83] Elisabeth Reed, "Using the Feldenkrais Method to Heighten Musical Awareness and Skill," 1.

ideas based on his own severe knee injuries.[84] Today, the Feldenkrais Method is one of the most used body awareness and rehabilitative techniques amongst musicians who want to alleviate pain, heighten one's kinesthetic awareness, or overcome injury. Cellist and teacher Elisabeth Reed believes that the method "alleviated what was a potentially career-threatening injury for me, its power as a tool for understanding those holistic contexts of movement and thought has been the Method's greatest contribution to my musical life."[85]

Not only do those who study this method feel that it gives musicians the physical freedom necessary in performance, but additionally, many feel as though it also allows musicians to break free from the physical barriers which may hinder not only technical facility, but it also creates musical expression in their playing. What many advocates of Feldenkrais believe, is that by becoming aware of the physiological nature of instrumental playing, it can not only free the body, but free the means of musical expression.[86] In other words, not only are you able to avoid injury or pain, and gain physical freedom, but also become more musical in terms of phrasing, and nuance. Uri Vardi, the University of Wisconsin, Madison cello professor, utilizes the Feldenkrais Method as part of his teaching philospohy. He believes that not only does the Feldenkrais Method aid his students with self-confidence and expression through a heightened sense of awareness, it also aids in the prevention and healing of injuries.[87]

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[84] Ibid.

[85] Ibid.

[86] Ibid.

[87] Uri Vardi, "The Feldenkrais Method Can Expand Musical Freedom, Experimentation and Imagination," 1.

The goal of this chapter was to introduce and suggest several disciplines, or practices that can aid the violinist transitioning to the viola through body awareness, while enhancing the kinesthetic sense and muscle memory. Additionally, evidence of injury to string players, with violists being the most prone to injury, proves that the player must be fully aware and understand their biomechanics. Furthermore, through advances in the medical field of performing arts medicine, a musician can seek specialists that focus directly on their playing technique, and how it affects the body.

CHAPTER 5

UTILIZATION OF THE LEFT HAND AND ARM

Introduction

This chapter will focus on the left hand and arm, including the shoulder on both the front and back of the body, and discuss how technical aspects of playing differ between the viola and the violin. The technical ideas in this chapter will be tied into previous discussions regarding the physical and anatomical differences of playing the violin versus the viola, with the goal of increasing body awareness and muscle memory. Amongst the topics I emphasize are playing in the lower and higher positions on each instrument, the use of *vibrato*, shifting, and general left hand use and articulation. Within each topic I provide a systematic approach to each instrument and its technical differences. When approaching the technical exercises, the player's focus should be on the kinesthetic feeling, and differing sensations being created within the specific muscle groups and areas of the body being referenced.

Concepts involving the use of the left hand and arm, will be the focus of the physical and technical analysis in the following chapter. I will offer images, illustrations, and musical exercises which have been created by myself, and inspired by studying and teaching both the violin and the viola, respectively. The following images and exercises should provide advise on how to facilitate the necessary changes one must make when transitioning to the viola. These ideas are widespread, and have been taught and performed for decades amongst violists.

However, these concepts are not found when studying the violin, but are explained in this chapter to be understood and utilized by the transitioning violist.

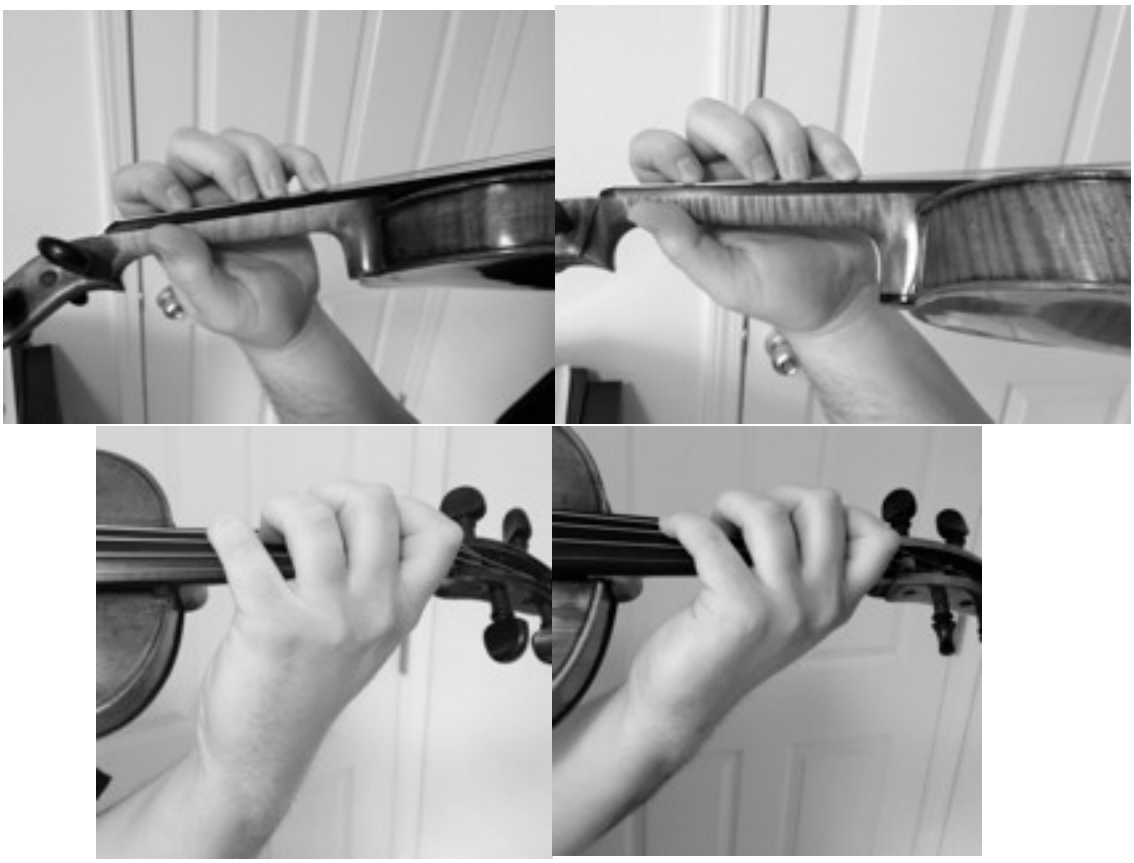
The Lower Positions

There are a number of factors that one must consider when playing in the lower positions on the viola. These factors coincide with the size and proportional differences with that of the violin. The fact the viola is longer, with a longer string length, and broader shoulders, means it must be approached differently from the violin. Because the viola is several inches longer, it changes the angles in which the hand and arm must work. These adjustments include the angle of finger placement, the wrist, the elbow, and the entire arm when properly playing the viola.

When playing the viola, the left hand is further away from you than with the violin. Therefore, the angle of the elbow must increase, or become more open, while the left wrist is slightly tucked closer to the neck. This aids left hand dexterity on the instrument because the fingers are at a slightly flatter angle making proper finger spacing easier in terms of both intonation and physical exertion. By adjusting the angles of the fingers, wrist, and elbow, it will lead to more comfort when transitioning from the violin. This awareness will greatly aid the violist, and will ultimately allow for the adjustment of the player's muscle memory. Violist Aaron Jonathan Au explains that "a flatter finger angle allows the hand to open up wider promoting

greater reach between fingers."[88] Additionally, the spacing of the hand must be more open for purposes of intonation.

Figure 5.1 Left Hand Comparison (violin on left, viola on right: images taken by author)



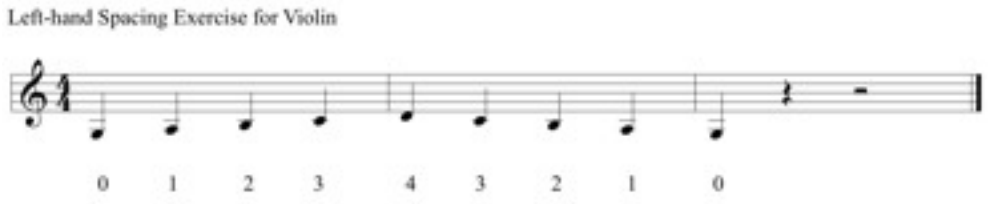
[88] Aaron Jonathan Au, "Four Recitals and an Essay: From Violin to Viola: A Discovery in Sound and Technique," (DMA diss., University of Alberta, 2007), 32.

Figure 5.1 illustrates the frame of the left hand on the violin and the viola. The images on the left are of the violin hand position. Notice that the thumb is not resting back and is in line with base of the index finger. Additionally, the wrist is not tucked in towards the neck of the instrument, and the fingers are upright, and on the very tip of the finger. In the photographs on the right, you will see that the left hand frame of the viola is slightly altered from that of the violin. The thumb must rest further back towards the scroll, the wrist is tucked in more closely to the neck of the instrument, and the angles of the fingers are not as upright as you would find on the violin. Because of the increased string length on the viola, these adjustments are necessary.

Playing the viola in the lower positions requires a slightly pronated wrist, as it is tucked closer to the neck of the instrument, and a greater amount of flexion of the forearm, especially on the lower strings and when coming around the shoulder of the viola. Additionally, the deltoid and trapezius are more active, due to the swing of the elbow during string crossings. Conversely, the biceps brachii is not heavily engaged in the lower positions. However, this is not the case when using vibrato, shifting, or in the upper positions of the viola. In the lower positions, the biceps brachii is most engaged when the elbow is at the C-string level, and most relaxed when on the A-string level.

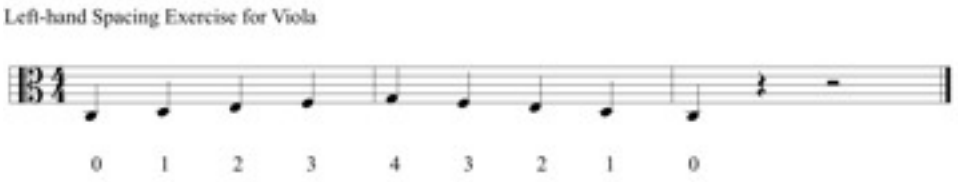
To understand the basic left hand frame, one can easily play a simple, five-note scale on the violin in first position, while holding all of the fingers down and maintaining a more comfortable and ergonomic feeling. Try this simple exercise. On the violin, utilizing the G-string, play the first five notes of a G major scale using the fingering, 0-1-2-3-4-3-2-1-0.

Figure 5.2



Try keeping all of your fingers down when ascending, and lifting fingers one-by-one when descending. As students studying violin, most are taught in this fashion when playing scales, or technical exercises like those of Schradieck. Now, using the fourth string, or C-string on the viola, try the same five-note scale, in C major, using the same fingering. When doing this, try to keep the fingers down, just as you would on the violin.

Figure 5.3



After doing this exercise, you should notice several key differences. Not only is it much more difficult to keep all of the fingers down in succession, but the spacing of the digits is much wider. This means retraining the left hand and arm is in order. You may have noticed that the attempt to keep all of the fingers depressed caused a bit of physical strain on the viola after doing the same exercise on the violin. Although this may have seemed counterintuitive, the point is that

you are physically aware that you must make these physical accommodations when playing the viola.

This time try the same exercise on the viola, but release the first finger from the fingerboard when you get to your third finger. The feeling now should be one of much more comfort, less strain, and ultimately more ease and accuracy with pitch. Now try the exercise one more time and pay particular attention the how the wrist is involved. Because the spacing is wider and the neck is larger, you must slightly pronate your wrist while playing the aforementioned exercise. Follow the steps above while making sure the the wrist is closer to the neck and the finger angles are slightly flatter. This will allow execution of this exercise without having to release the first finger, as if it was played with similar ease to the violin. While this is a small degree of movement pivoting with the wrist, it functions by creating a much more free and relaxed left hand. This awareness, even with something very simple, can prevent injury.

Playing certain passages like fingered octaves, and tenths on the violin are possible and found throughout the standard literature. On the viola, these concepts are rarely, if ever utilized, in part because of the proportions and size differences of the violin and the viola, respectively, as well as the physical strain it would create when attempting these exercises on the viola. The same sort of principle applies when approaching four-note chords. Try this as an exercise. On the violin, play an A major chord in first position with this figuration, A-E-C#-A, and keep all of your fingers down. You will find that this is executed comfortably, without strain on the left hand, and without sacrificing pitch.

Figure 5.4

Now, attempt the same idea on the viola, but a fifth lower. Play a D major chord in first position with this figuration D-A-F#-D, while keeping all of the fingers down just as was done on the violin.

Figure 5.5

You should notice several things. First, the frame of the hand must be more open and may not feel as natural as it did on the violin. Second, you may notice that the intonation of the chord is not very accurate, and finally, you should feel as though the elbow needs to be more involved. These differences are due to the width of the neck and the wider separation of the strings on the viola, and the fact that the elbow requires a wider range of motion when swinging beneath the instrument. Juliet White-Smith points out that, on the viola "the left arm must have more swing from right to left when crossing from the C string to the higher strings. Greater right-to-left swing allows the pads of the fingers to contact the fingerboard on both sides of the string and

results in greater ease of playing."[89] What this means, quite simply, is that on the violin the elbow does not have to swing to the right as much when utilizing the lower strings and conversely, does not have to release out to the left as far when approaching the upper strings. Once again, attempt the same chord on the viola. This time, bring the elbow to the right, further around the viola, and under the neck on the C-string, depress just the bottom two pitches, then simultaneously release the left arm outward to the left, and release the first finger while dropping the second and third fingers on both the D and A strings, respectively. The awareness here is that not only is the sensation more comfortable, but also the release of the first finger greatly improves accuracy in terms of pitch. By releasing the bottom notes of the chords and allowing the elbow to swing out to the left, there is a release of the tension in the left arm. In particular, the muscles of the forearm, biceps brachii, and deltoid, immediately relax as the elbow releases to the left. Finding this level of efficiency in viola playing, can greatly help to avoid strain or injury. As will be discussed throughout the remainder of this chapter, the left elbow is crucial in terms of technical facility and accuracy when playing the viola.

Figure 5.6 also shows the physical differences in the use of the elbow, when on the lowest string of each instrument, respectively. Notice that the wrist is closer to the right shoulder of the viola, and that the elbow is around the instrument more on the viola than the violin. These images can be somewhat deceptive if one fails to remember that the width of the shoulders are much wider on the viola, so that must be taken into consideration. Furthermore, if the images are carefully examined, one can see that the muscles of the forearm, known as the flexors and extensors, are more engaged on the viola because of the positioning of the arm and the swing of

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[89] White-Smith, Juliet, "From Violin to Viola: Making the Switch a Success," 58.

the elbow. What cannot be seen is that the biceps brachii is also more engaged on the viola in its lowest register for the same reason. However, the fact that the biceps brachii is more visible in the viola image, indicates that it is involved. The left shoulder also carries more weight when playing the viola. Because the swing of the arm around the instrument, one can feel flexion of the deltoid. Notice the the angle of the elbow is much more open on the viola, and depending on the instrument length, the difference could be as great as 15 degrees.

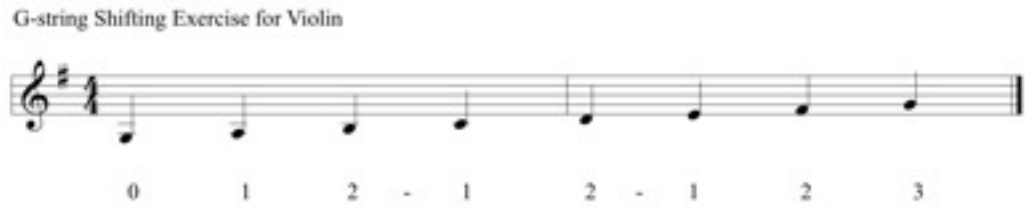
Figure 5.6 Left Elbow Comparison (violin on left, viola on right: images taken by author)

Shifting

For decades, viola pedagogues have taught us that regardless of the exact size or shape of the viola, shifting revolves around how we use the elbow, as it is integral to being able to shift smoothly and accurately. As was discussed with the execution of four-note chords on the viola, the elbow has to be able to swing from side to side in the manner of a pendulum when moving from the C-string to the A-string, and back. While this is still necessary on the violin, it is hardly as drastic a motion as it is on the viola.

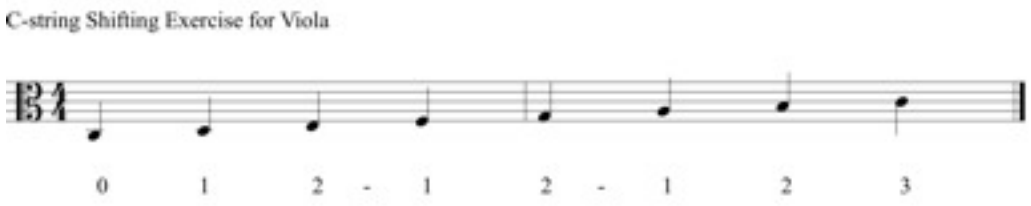
While shifting in the lower positions may feel very similar in motion from violin to viola, and with only slightly larger intervallic relationships, it is not until you start to reach some of the upper positions where differences occur. As an exercise, try a simple, one-octave G major scale on the violin, only using the G-string, and the fingering 012-12-123. In this exercise the dash (-) indicates a shift.

Figure 5.7



It should be noticed that the right shoulder of the violin does not restrict movement, and the scale can be played efficiently and comfortably. Now, try the same fingering, this time on the C-string of the viola, a fifth lower, in the key of C major.

Figure 5.8



In this case, one should feel that in order to successfully accomplish this exercise, the elbow must come around the instrument in order to get around the right shoulder of the viola.

Even when shifting to fifth position on each instrument, the player can see several subtle differences in how the arm must adjust from the violin to the viola. Figure 5.9 illustrates these differences. First, the player can see that the angle of the elbow is still larger on the viola. Second, the elbow is further around the instrument, while the wrist follows around the right shoulder of the viola. The pivot of the wrist coming around the shoulder, and the swing of the

elbow around the viola, engages the biceps brachii, the extensor and flexor muscles from the elbow to the hand, as well as the deltoid on the shoulder. The act of shifting requires a great deal of use of the biceps brachii, and although this is a large muscle, it should remain as relaxed as possible, avoiding any excess tension. Excessive tension with this muscle can lead to injury. Additionally, the use of left hand requires smaller spacing and shifting movements on the violin, whereas on the viola the left hand spacing and shifts are somewhat larger. However, just as you get into the upper positions on the violin, intervallic spacing become smaller. Being aware of the elbow and how it, and the hand, must move around the shoulder of the viola when shifting is one of the most difficult adjustments the player must make. When reaching the upper positions of the viola, these differences become even more vast.

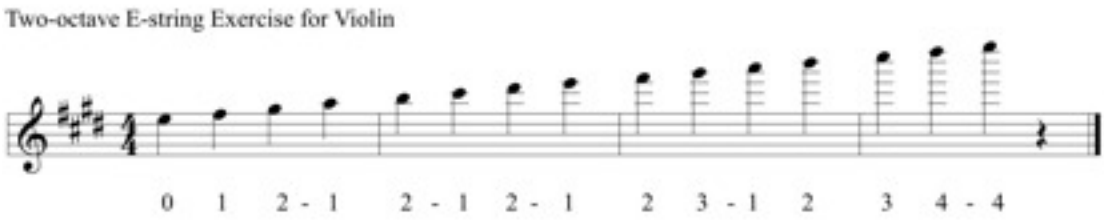
Figure 5.9 Fifth Position Comparison (violin on left, viola on right: images taken by author)

The Upper Positions

Some of the most striking differences in playing the viola, when compared to the violin, revolve around use of the left arm in the upper positions of the instrument. In fact, the technical aspects of playing the viola in the uppermost positions of the instrument are completely different from those required on the violin. The awareness of these differences are not widely known due in large part to the fact that music written for viola, especially works like those of Hoffmeister and Stamitz, which predate Romanticism, do not always utilize this register of the instrument. However, the violinistic works of the Romantic era, viola concertos of those like Bela Bartok, and even some orchestral literature from Romanticism and the 20th century, explore this upper register. Keep in mind, that playing in the upper positions of the viola requires the most physical strain on the body. The trapezius, deltoid, biceps brachii, flexor and extensors, and the muscles of the wrist and hands, are all heavily engaged in the upper positions. Because the elbow, arm, and hand must come around the shoulder in a very contorted manner, the player can easily become injured when exploring these positions. Awareness of the tension in the arm, and working to release it is very important to the success of playing in the upper register. Efficiency and fluidity of motion are important to avoid the host of injuries that can be sustained throughout the left arm. From shoulder impingement, nerve entrapment, to bursitis, tendonitis, and cubital tunnel syndrome, the array of potential injuries can be avoided by following the steps outlined below.

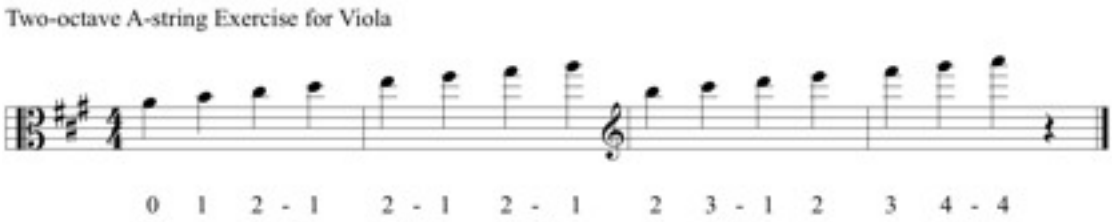
In order to understand this fully, try a two-octave E major scale on the violin, utilizing only the E-string, and the fingering 012-12-12-123-12344.

Figure 5.10



One should take note of the fact the right shoulder of the violin does not interfere with shifting to the upper positions which near the end of the fingerboard. Additionally, these positions can be reached without releasing contact with the thumb from the saddle of the neck. The E-string can be fully depressed with the fingers in the highest positions. Now, on the viola, only utilizing the top A-string, try an A major scale, taking note of the physical aspects which make this very difficult to execute.

Figure 5.11



What makes this such a difficult exercise on the viola? Three factors: first, the movement around the right shoulder of the viola, second, the fact that these upper positions cannot be reached with the thumb on the saddle of the neck, and third, because the A-string cannot be fully depressed near the edge of the fingerboard.

Try the exercise again, slowly and methodically. When you get into fifth position, make sure you bring the elbow around the instrument as much as possible, while avoiding any physical strain. This will insure that you are able to get around the right shoulder of the viola. Then, while continuing up the scale, release the thumb from the saddle when you feel as though you are stretching or reaching. Once you release the thumb, allow it to follow your left hand around the saddle and along the right side of the fingerboard. This step allows you to comfortably be on top of each of the fingers, which is a sensation unique to the upper positions of the viola, facilitating dexterity and clarity of sound. As mentioned earlier, pitches nearing the end of the fingerboard cannot be fully depressed with the left hand on the viola, so as you ascend to the top of the scale, place the fingers not on top of the string, but directly and firmly against the left side of the string. Your fingertips should be touching the fingerboard, whereas the strings should rest against the pad of the finger. Refer back to Figure 5.9 for clarification. Keep in mind that the thumb should still be against the right side of the fingerboard. You should notice that this will give you a clear and defined tone without depressing the string.

The images below illustrate the physical considerations that must be made when playing in the upper positions on the violin and then on the viola. Figure 5.12 shows the left hand upon completion of the two-octave E major scale. Notice that the thumb is still connected to the saddle of the violin. Also, make note that the fingers are on top of the violin, with the strings being fully depressed. Note the differences in Figure 5.13. In this case, the thumb of the left hand has been released from the saddle and is against the right side of the neck. Additionally, the fingers are not depressed, but resting against the left side of the string, as discussed earlier.

Figure 5.12 Left Hand in the Upper Positions of the Violin (images taken by author)

Figure 5.13 Left Hand in Upper Positions of the Viola (images taken by author)

The most important thing to remember while attempting this exercise is that at any point that you feel pain, stop immediately. The main objective of this is to facilitate the transition to viola while being aware of these drastic changes. Doing so will greatly help to avoid pain or injury. It is not a simple transition to make, and the kinesthetic awareness one must have when approaching this exercise is paramount.

Vibrato

Vibrato is a rapid oscillation of pitch. It can be used to create different timbres and colors. While the underlying principles of *vibrato* remain the same from violin to viola, there are several things a violinist should be aware of when switching to the viola. If you consider the string family as a whole, the violin, generally speaking, utilizes the fastest and most narrow *vibrato*. Conversely, the double bass utilizes the widest and slowest *vibrato*. Therefore, as the size of the instrument increases, the *vibrato* on the instrument becomes increasingly wider and slower. This has a great deal to do with the string length. While the disparity is nowhere near as vast from the violin to the double bass, it does represent a necessary adjustment when approaching *vibrato* on the viola.

First, it should be noted that because *vibrato* is a musical tool used to create different tone colors, that it is necessary for every string player to be able to manipulate the speed and width of their *vibrato*. The violin, for example, needs a fast, sparkling *vibrato* on its bright E-string in order to convey that brilliance. However, on the G-string, when attempting a rich, robust, and powerful sound, *vibrato* may become a bit wider and somewhat slower. Second, in order to alter

the timbre, the player can manipulate the part of the fingertip that is being used. For a faster *vibrato*, the very tip of the finger is necessary, whereas for a slower and wider *vibrato* one can utilize more of the fleshy pad of the fingertip as seen in Figure 5.14.

As a general rule, those same principles apply to the viola, but must be slightly altered because of the range of the instrument. Additionally, the longer string length and gauge of the strings require slightly different physical adjustments on the viola. The hand must be slightly more open, so that it, along with the fingers and wrist can oscillate more freely. The wider string gauge and string separation requires more contact with the center of the fingertip while playing the viola. In general, "a flatter finger angle helps widen the vibrato."[90]

Figure 5.14 Viola Finger Placement for Vibrato (image taken by author)

Finally, if you consider the aforementioned discussion regarding the upper positions on the viola, the use of *vibrato* must be altered because of the changes in hand position. *Vibrato* can be used in the extreme upper positions of the viola, but consider from a physical standpoint, that

[90] Aaron Jonathan Au, "Four Recitals and an Essay: From Violin to Viola: A Discovery in Sound and Technique," 32.

the motion is very different and unique. Keep in mind that the arm is around the right shoulder of the instrument, and the elbow is well under the body of the viola, while the thumb is along the fingerboard and fingers placed against the left side of the string. As mentioned earlier, simply playing in these positions can be the most physically strenuous. Being in the uppermost register of the viola also requires the fastest and narrowest motion. The addition of *vibrato* further complicates things, but keep in mind that being as physically relaxed and free as possible will further your ability to accomplish these tasks. It would not be stretching to say that the viola player ultimately seeks the brilliance of the violinist's *vibrato* in the upper register and the richness of the violoncello in the lower register.

Injuries can certainly cause by the misuse of *vibrato*. Because vibrating on the viola feels as though it requires more of a physical workload, beginners tend to overcompensate, and their *vibrato* becomes a product of tension. As discussed in Chapter 3, *vibrato* combines small muscle movements of the fingers, the wrist, the forearm and the biceps brachii. If there is too much tension in the hand or arm, tendonitis from the hand to the biceps brachii, and carpal tunnel syndrome, are distinct possibilities for those lacking kinesthetic awareness.

Left Hand Articulation

If the player takes into consideration the proportional differences between the violin and the viola, then one must compensate for the larger string gauges and height of the strings in terms of the player's left hand articulation. In many ways, the fingerboard on the violin and viola acts

as a springboard, propelling the fingers back up after they have been dropped into position. If you consider that because the bridge is taller on the viola, making the strings raised further from the fingerboard, the left hand has to be, in general, more active. What this means is that there is a larger motion when the fingers rebound back off of the fingerboard. Additionally, this larger motion of dropping and rebounding aids the violist in getting a faster response from the heavier gauged strings, greatly increasing the player's clarity. This principle is increasingly important as you descend to the low register of the viola, and in particular with the use of the C-string.

When playing technical passages on the viola it is important to notice the difference in the use of the fingertip. In order to play technical passages, more of the extreme tip of the finger should be used to enable finger-dropping, which adds more clarity and a percussive nature to the left hand. However, when playing a slower, more lyrical passage that is, for example, rich with *vibrato*, it is important to use the fleshier part of the fingertip, in order to create difference timbres and bolder, more powerful, and resonant sound. The images in Figure 5.15 show the difference in the fingertip placement.

Figure 5.15 Varying the Left Hand for Technical versus Lyrical Playing (images taken by author)

The image on the right illustrates the left hand playing a more technical passage, whereas the image on left shows the fingertip if being used in a lyrical passage.

This analysis of the left hand and arm articulates the subtle changes when transitioning from the violin to the viola. The goal is for the violinist to become aware of these differences while focusing on the kinesthetic sensation created in each topic being referenced. When using proper viola technique, the transitioning violinist becomes aware of these differences, facilitating muscle memory through repetition. It is my hope that the images of the technical differences be referenced for proper technique when transitioning from the violin to the viola.

CHAPTER 6

UTILIZATION OF THE RIGHT HAND AND ARM

Introduction

While there are significant differences between the left hand and arm and how they function on the violin versus the viola, it can be argued that differences in bow technique, or how the right hand and arm function, are more pronounced. William Primrose echoed that "most of the faults I find with people that come from the violin [to the viola] lie in the bow arm, and that's a very big problem indeed, and one that I find deeply interesting."[91] Consider the following ideas, and reference Figure 2.1 for the average weight, and proportions of violin and viola bows. Because the viola bow is heavier, with a larger frog and stick (approximately 1 millimeter all around), the bow grip must be more engaged and secure. Violin and viola bows are very similar in terms of their length. The average weight of a violin bow is approximately 60 grams, whereas a viola bow may exceed 70 grams. Because the distance from the base of the viola to the bridge is greater than that of the violin, the viola bow sits up to several inches further away from the player. This moves the complete apparatus and the arm slightly forward, which in turn, changes the angle of the arm and where the contact point feels as though it should be when transitioning from the violin. This slight movement of the right arm forward engages the trapezius and the deltoid, and creates a different sensation than what is found on the violin. The use of the bow is

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[91] David Dalton, *Playing the Viola: Conversations with William Primrose* (New York: Oxford University Press, 1988), 5.

also quite different in terms of how to initiate bow strokes and the weight that must be used to get a deep, core sound on the viola.

These concepts, regarding the use of the right hand and arm, will be the focus of the physical and technical analysis in the following chapter. In this chapter, I offer technical exercises and images, along with explanations of how to adjust the technique of the bow arm, in order to facilitate the necessary changes the player must make when transitioning to the viola.

The Bow Grip

There are a several schools of thought regarding violin bow technique, and violinists like Jascha Heifetz, David Oistrakh, and Yehudi Menuhin, just to name a few, employed bow grips that are drastically different than that of a violist. Generally, the violin does not require as much weight into the string as does the viola, which means the use of the thumb, pinky finger, index finger, and the grip's overall positioning can differ from what is necessary on the viola. Primrose wrote quite a bit about the sensation that the fingers should hang down in a similar fashion to that of a cellist, so as to have greater control, and so that more natural weight from the arm can transfer from the grip into the instrument, creating the necessary weight into the string.[92] In his teaching, Primrose emphasized "the importance of a firm and supple grip...A careless, loose grip

[92] Yehudi Menuhin and William Primrose, *Violin & Viola* (Kahn & Averill, 1976), 176-177.

will produce a tone that is fuzzy and lacking in body."[93] He goes on to say that the fingers should be "encircling the stick much more amply than is common practice on the violin."[94]

To set up the viola grip, first place the thumb in-between the leather grip and the frog. The thumb should be pointed upward, directly into the bottom of the octagonal stick. When looking at the right thumb, it is the right side of the fingertip that should be utilized. The thumb should be bent and near the horsehair. The middle finger should then hang down and lay against the silver of the frog, whereas the ring finger should hang in a similar fashion, completely covering the eye of the frog. The index finger should rest just above the first knuckle from the fingertip, and the pinky should be constantly engaged, curved and resting on the top of the octagonal stick. The right edge of the pinky should be inline with the right edge of the frog. This setup will allow for a supple, yet firm grip, with excellent balance from frog to tip. As discussed in Chapter 3, tendonitis, trigger finger, and trigger finger of the thumb are the most common injuries associated with overuse and excess tension in the bow hand. Too much upward pressure from the thumb and downward pressure from the index finger can lead to injury.

In Figure 6.1 you see a comparison of standard bow grips used on both the violin and on the viola. On the top are standard violin bow grips, as modeled after Galamian[95], as well as viola bow grips, modeled after Primrose[96], on the bottom. From left to right, each of these grips are at three points in the bow; the frog, the middle, and the tip of the bow. Notice that the fingers on the

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[93] Ibid.

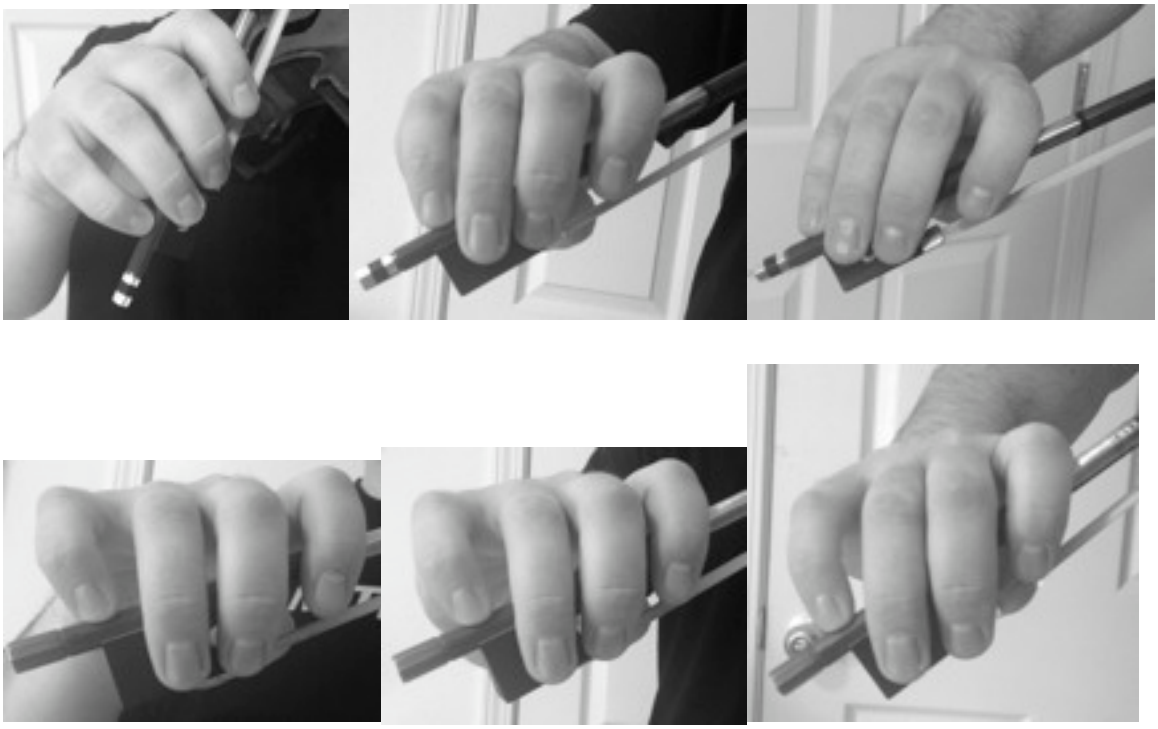
[94] Ibid.

[95] Ivan Galamian,. *Principles of Violin Playing & Teaching* (Ann Arbor, MI: Prentice-Hall, 1985) 46-49.

[96] Yehudi Menuhin and William Primrose, *Violin & Viola*, 176-177.

violin bow are not as fully connected to the frog as they are on the viola. Also, consider that as you work towards the tip of the bow, contact with the pinky finger is not as engaged, and in some cases, the pinky finger does not even require contact with the frog of the violin bow.

Figure 6.1 Bow Grip on the Violin (top) versus the Viola (bottom), (images taken by author)



The viola grip, on the contrary, requires more contact with all of the fingers. The fingers should hang down and have good contact with the entire frog, while the pinky is always engaged from frog to tip. The reason for adapting the bow grip from the violin to the viola is largely because the viola bow is heavier and bulkier, and greater contact leads to greater control. Additionally, more weight from the hand into the bow creates the depth of sound that is necessary when playing the viola.

More recently, pedagogue and violist Thomas Riebl, who also is an advocate of a firmer grip, teaches that the grip of the bow is similar to that of a "good handshake."[97] He means that one should not squeeze, but should use "good energy"[98] when holding the bow. Riebl explains that this energy within the grip of the bow "he compares the tips of the fingers to suction cups. This allows the bow to be held with firmness yet the fingers still have an inherent flexibility (or suppleness, as Primrose refers to it) in them."[99] Riebl goes on to explain that the firm, yet flexible fingers should not be active, meaning that "they do not initiate any bow motion on their own but rather react to the pull of the bow arm and the friction of bow against string."[100]

Weight and Core Sound

If you also consider the heavier gauged strings, and the range of the viola, the response time for the string to create sound is much slower than the violin. Additionally, the fact that the resonating body of the instrument is not as large as it should be acoustically, the natural weight of the player's arm must transfer into the firm bow grip, which, is then firmly planted on the string. This will give the new violist a greater ability to create the unique depth of sound that is necessary. Aaron Jonathan Au explains that "without proper adjustments to violin technique to

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[97] Aaron Jonathan Au, "Four Recitals and an Essay: From Violin to Viola: A Discovery in Sound and Technique," 26.

[98] Ibid.

[99] Ibid., 28.

[100] Ibid., 28.

account for these differences, it is very easy for a student to play the viola with an unfocused sound. Not only does the lack of focus negatively affect the character, but it also affects the projection of the viola sound into the performance space."[101]

Weight should come from the release of the shoulder, in particular the deltoid and trapezius, while letting the elbow drop. At that point, one should feel a great deal of resistance with the bow, as though it almost will not budge from its position. If this weight is planted into the string, one can achieve the pull into the viola and necessary depth of sound. The use of the viola bow also requires a slower, more gradual motion, similar to that of a cellist. Juliet White-Smith emphasizes pronating the wrist and forearm as a means to "use natural arm weight rather than applying pressure, which can result in a less resonant sound and possible injury."[102] It is also important to utilize flatter hair on the string in order to create a bigger, bolder sound, without additional force. Renowned pedagogues Karen Tuttle and William Primrose explain that the "flatter angle of the bow seems to promote a bigger tone with no increase in effort, according to the experience of many eminent string players."[103] In order to flatten the bow hair, slightly drop, or pronate the wrist. This will bring the stick back towards the violist's body, flattening the hair. What the violist is seeking is a pronounced core sound, that is full and penetrating. Karen Tuttle calls this the "big"[104] sound, where the viola has a focused voice. She feels as though this

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[101] Aaron Jonathan Au, "Four Recitals and an Essay: From Violin to Viola: A Discovery in Sound and Technique," 19.

[102] Juliet White-Smith, "From Violin to Viola: Making the Switch a Success," 57.

[103] Aaron Jonathan Au, "Four Recitals and an Essay: From Violin to Viola: A Discovery in Sound and Technique," 29.

[104] Ibid., 36.

focused energy should be created at every dynamic level.[105] Most violinists approaching the viola cannot create this sound right away. As Thomas Riebl said, “it is important to open your ears to a focused sound. Most of you are used to playing with a floating sound.”[106] Being physically aware and releasing of the trapezius and deltoid, while also dropping the elbow and wrist are necessary to create this type of sound, are very important to avoiding injury. This additional weight into the string, along with a differing bow grip, also aids the execution of every bow stroke on the viola.

Execution of Bow Strokes

It should now be clear to the reader why the approach of executing bow strokes is different from violin to viola. Remember that the larger viola bow requires a firmer grip. Also keep in mind that because of the heavier gauge and longer string length, the attack, or initial articulation of the stroke, will respond much slower than the violin. There are a number of things to also consider when approaching bow strokes on the viola. For example, string crossings require a larger motion, because the bridge is taller, wider and more heavily arched. As a simple exercise on the violin, try string crossings, using your open strings, across each pair of strings. Do this slowly at the frog, the middle of the bow, and the tip of the bow, feeling the connection

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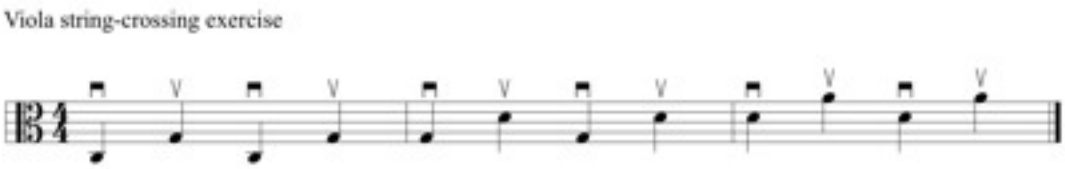
[105] Matthew Anderson Dane, "Coordinated Effort: A Study of Karen Tuttle's Influence on Modern Viola Teaching," 30-32.

[106] Aaron Jonathan Au, "Four Recitals and an Essay: From Violin to Viola: A Discovery in Sound and Technique," 36.

with the bow to the string while keeping an eye on the circular motion that the wrist must make in order to connect the strokes. Now try the same idea on the viola, paying careful attention to the newly adjusted bow grip and flatter use of the hair.

Figure 6.2

Figure 6.3



Simply put, string crossings on the viola require more active pronation and supination of the wrist in the lower half, as well as more activity in the extensor and flexor muscles of the forearm. In the upper half of the bow, the larger muscles, such as the deltoid of the shoulder, and the biceps brachii, are more engaged. Additionally, when playing the viola, a greater degree of weight is necessary, which, in turn requires a slower, more gradual pull and push of the bow. The weight of the arm creating downward force into the instrument is also something to pay

particular attention to when playing the viola. A sinking, or releasing sensation of the deltoid and lower trapezius will aid the violist to find the natural weight necessary to get a strong pull of the bow.

The violin responds extremely quickly with very little weight. As another simple exercise, let us approach these bow strokes on both instruments, taking note of the physiological accommodations one must make on the viola. For example, you should feel on the viola, that there is much more resistance when using the bow. This, coupled with a more compact motion and slower, more gradual bow speed, should aid the new violist by enabling the depth of sound that is capable on the viola.

Jonathan Au points to Thomas Riebl for his idea of the "swing stroke"[107] as a way to create a powerful sound from frog to tip, pointing out that the principal idea is that one should follow the contour of the stick. What Riebl suggests is that the pull and push of the bow is not a completely horizontal motion, but rather a downward arching motion which pulls into the middle of the bow, with a follow-through to the tip. The release of the deltoid and trapezius greatly enables this concept, while dropping the elbow and pronating the wrist completes the motion towards the tip of the bow. What this creates is a sweeping or swinging motion with the bow, following the concave stick, rather than the straight line of the horsehair. Because of the downward release of the upper extremities, Riebl's concept will enable a more focused and powerful sound, whereas the physical freedom will aid in the viola player's ability to avoid an injury.

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[107] Aaron Jonathan Au, "Four Recitals and an Essay: From Violin to Viola: A Discovery in Sound and Technique," 26-27.

Similarly, Karen Tuttle offers the idea of the "repull"[108] as a means to generate similar power and intensity throughout the bow stroke. With a technically proper bow grip, the balance of the hand shifts when in motion. On a down bow, while at the frog of the bow, the weight of the bow is shifted to the pinky finger. As the down bow continues to the tip of the bow, the balance transfers from the pinky finger to the index finger. Tuttle's idea lies within the transfer to the index finger. She explains that "When you feel the first finger taking paramount pressure, you feel the pull across the knuckles towards the fourth finger and then the fingers straighten out towards the tip."[109] This concept allows for a more focused sound and energy when moving towards the tip of the bow. Au points out that these two ideas are very effective for "maintaining and even creating energy near the tip, allowing for sustained expression."[110]

As an exercise, try a simple two-octave G major scale on the violin, and then a two-octave C major scale on the viola. When doing this exercise, feel free to utilize the open strings and complete the scale in first position on both instruments. With the scales, try the following bow strokes, starting first on the violin and then on the viola. Start with *collé*, then *martelé*, and finally *spiccato*. With the *collé* stroke, attempt the scale at the frog, middle, and tip of the bow, first on violin and then on viola. Make sure that the bow is completely engaged with the string before initiating each stroke. If familiar with this stroke on the violin, it is apparent that there is not much weight required to generate the necessary clarity in the sound, and the release of the stroke is quick, using fast bow speed regardless which part of the bow is utilized. Now attempt

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[108] Aaron Jonathan Au, "Four Recitals and an Essay: From Violin to Viola: A Discovery in Sound and Technique," 27.

[109] Ibid.

[110] Ibid.

the same concept on the viola, keeping in mind that if you approach the stroke as done on the violin, the sound will not have enough clarity and articulation. To execute this, drop all of the weight of the arm into the string, feeling heavy resistance, and good contact throughout the bow grip. The attack, or initiation of the stroke comes from the bow so firmly planted into the string that it does not want to budge. With a small and slow motion, slightly flick the wrist, engaging the fingers and wrist. This stroke, done with the fingers and wrist, should give you the necessary clarity of sound if the aforementioned steps are followed.

Next, attempt the same scales using a *martelé* stroke. Again, first on the violin and then on the viola. "Martelé is an excellent stroke for developing clear articulation. Less bow will be used for executing this stroke on the viola than on the violin."[111] Also, make sure that each stroke is properly prepared before its initiation. On the violin, the attack of the stroke must not be too heavily into the string as it will cause a rough, distorted sound. Furthermore, one should take note of the speed of the attack and the release of the stroke, as this velocity is much greater on the violin than the viola. Now, attempt the same exercise on the viola. If approaching the stroke as one would on the violin, the clarity of the attack will be lacking and the release of the stroke will lack depth of sound. After completion of this exercise, it should be apparent that the attack of the stroke is deeply rooted in the *collé* stroke. That same amount of weight and resistance is necessary for the clarity of sound. Drop the arm and sink into the string. Release the trapezius, deltoid, and let the elbow hang. Try incorporating Riebl's idea of the "swing stroke"[112] into the *martelé* stroke. This will give the stroke a focused and more sustained tone throughout, because

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[111] Juliet White-Smith, "From Violin to Viola: Making the Switch a Success," 58.

[112] Aaron Jonathan Au, "Four Recitals and an Essay: From Violin to Viola: A Discovery in Sound and Technique," 27.

unlike the horizontal motion of the violinists' *martelé*, the violist can follow the contour of the bow to follow through the motion with a slower and more gradual pull of the bow.

Finally, let us examine the use of the *spiccato* bow stroke on each instrument. Attempt the same scale on the violin. In an effort to become fully aware of the subtle differences between the two instruments, attempt this exercise at the balance point of the bow, at a medium pace, with a brushing sensation. As a suggestion, try four strokes per pitch at sixty beats per minute. On the violin, the kinesthetic sensation is that the motion is somewhat on the horizontal side, because a stroke that is too vertical adds additional noise to the sound. It can also be easily executed higher in the bow on the violin because the balance of the stick is different than the viola bow. Pay particular attention to the motion of the fingers and wrist and the connection with the fingers of the bow grip. You may also notice that the fingers do not have to be fully connected to the bow in order to execute this stroke. The natural spring of the violin bow and its lighter weight allows for this.

If you attempt this exercise on the viola you will find that this idea is to the contrary. In this case, where the viola is concerned, one should notice that the brushed *spiccato* stroke requires connectivity with all fingers of the bow grip, and importantly, the engagement of the pinky finger. Awareness of the pinky finger will enable a balanced stroke. Also, the use of flatter hair, and bow placement closer to the frog will produce a fuller, more rounded sound. Additionally, the stroke must require good contact with the string and a rounded release, or a marriage of both the vertical and horizontal motion. In other works, the stroke should create a motion that resembles the bottom of a small circle. This facilitates a round sound, while enabling the instrument to continue to resonate in between strokes, because the string continues to spin. If

the stroke is approached in the manner it would be on the violin, the sound would be fuzzy and unclear, without projection and resonance. The fingers and wrist should be heavily involved in the *spiccato* stroke, and at a slow tempo you will find some counteraction with the muscles of the forearm.

It is my hope that these exercises prove to be useful tools when approaching the viola bow and its execution. These physical adaptations are necessary when making the transition from the violin to the viola, with the intention that the transition can be made with more awareness and less frustration because of issues that lie within sound production. This will insure that, as a violist, you are able to avoid the pitfalls and obstacles that myself and many others have suffered when approaching use of the viola bow.

CHAPTER 7

CONCLUSION

It is clearly evident that the viola is not just a larger violin, and should not be treated as such. The new violist should carefully study the instrument, making a concerted effort to understand how the proportions and size affect tone production, which, in turn, affects the player's technical approach. Doing so will enhance the player's ability to progress rather than regress, while also increasing awareness and avoiding injury.

It is always important to find the right size viola for you, and in doing so, the main objective is the sound of the instrument. If you follow the guide above, and use the provided exercises in the correct manner, it will not matter what size or shape of viola is being played. When making the transition, always be aware of how the musculoskeletal system works within the upper body and its extremities. Being fully aware of the physiological aspects of performing on these instruments, such as the muscle groups and their activity, will aid the understanding of how to release tension and avoid injury. Consider the regions of the upper body independently in order to isolate its intramuscular workings. In Appendix 1 you will find images of the musculoskeletal system in order to further your investigation. Remember that because the viola is larger and heavier, it requires a great deal of physical exertion, and more so than what is required on the violin. Therefore, a thorough understanding of the anatomy will greatly aid the physical adaptations the player must make when transitioning.

Violinists and violists are constantly training small muscles and many different muscle groups, so they can certainly be considered athletes. Any athlete must consider a great deal of

physical education in order to have proper technique at a given task. This is true of musicians as well, and in particular, string players. Fortunately, for musicians, more and more studies are being done in order to cite the host of musculoskeletal disorders, discomfort, and pain that the majority of musicians will deal with over the course of their careers. Because of career ending and career threatening injuries to some prominent musicians, the sports-medicine related field of performing arts medicine has vastly grown in recent years. With physicians studying how performers use their instruments, they are able to more easily diagnose an injury or ailment, by using modern technology like three-dimensional mapping and electromyography. These breakthroughs in the medical field will almost certainly benefit not only current musicians, but also the next generation, and generations to come.

Because awareness is truly the key to making a successful transition from the violin to the viola, it is recommended that these instrumentalists seek a better understanding of their physiology. Several useful techniques have been explored as a means of introducing ideas that may facilitate better body awareness, body mapping, and muscle memory. Ancient disciplines such as *tai chi* and *yoga* have often been used for musicians seeking heightened awareness and relief from pain and injury. Additionally, Alexander Technique and the Feldenkrais Method have proven to be extremely therapeutic. Both of these techniques focus on retraining and reeducating our bodies through awareness and understanding. While everyone has their own interests, the idea was to introduce these various disciplines so that one, if not more, may suit a particular individual, and lead to a pain-free, long-lived musical career.

When addressing the adjustments the player must make when switching from the violin to the viola, take plenty of time, thinking through things as methodically as possible. Isolate each

technical issue, and the accompanying physical demands, one at a time. This will be the first, and most important step in making a successful and seamless transition, while progressing and avoiding injury. Trust your knowledge, trust your body, and know its limitations. Make a concerted effort to maximize your awareness physically, mentally, and technically. If you take things slowly and follow the ideas and information in this guide, you will be able to make a successful transition from the violin to the viola.

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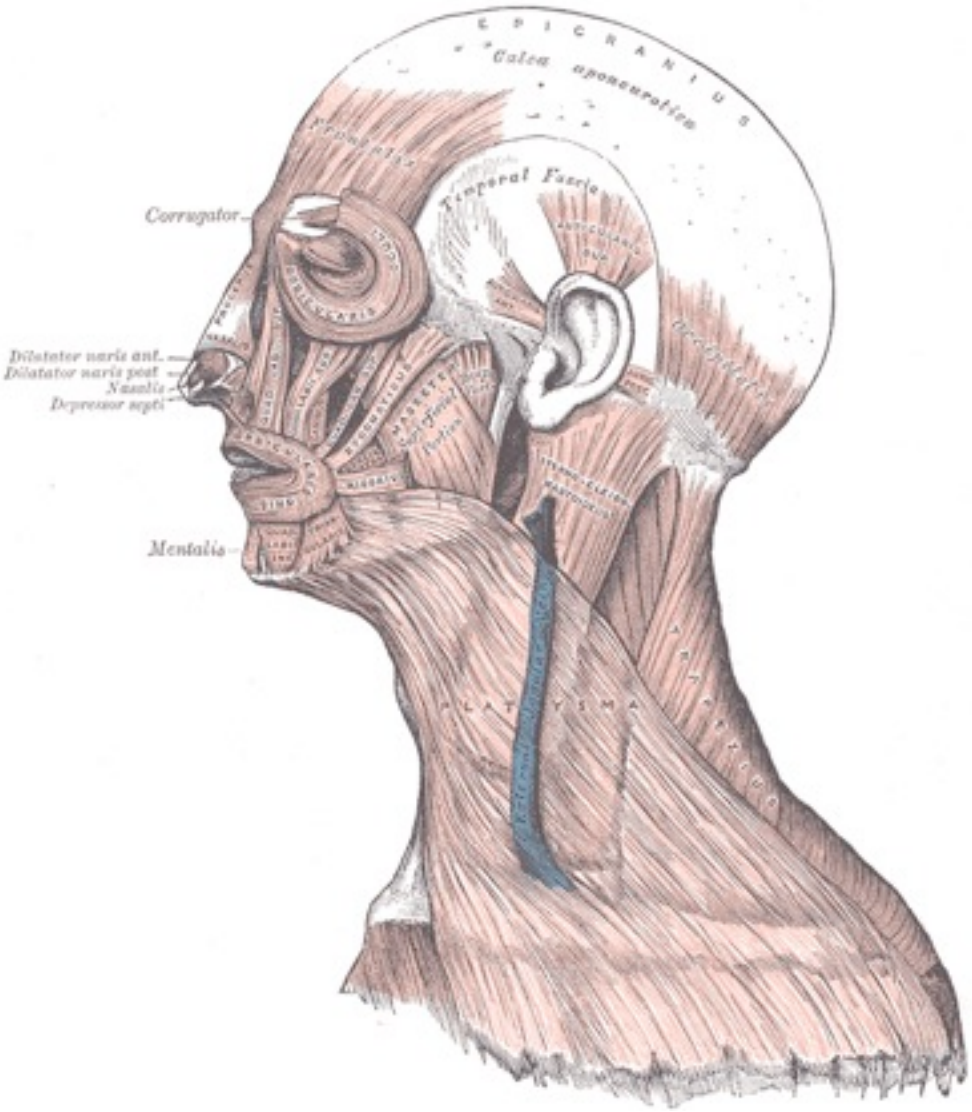
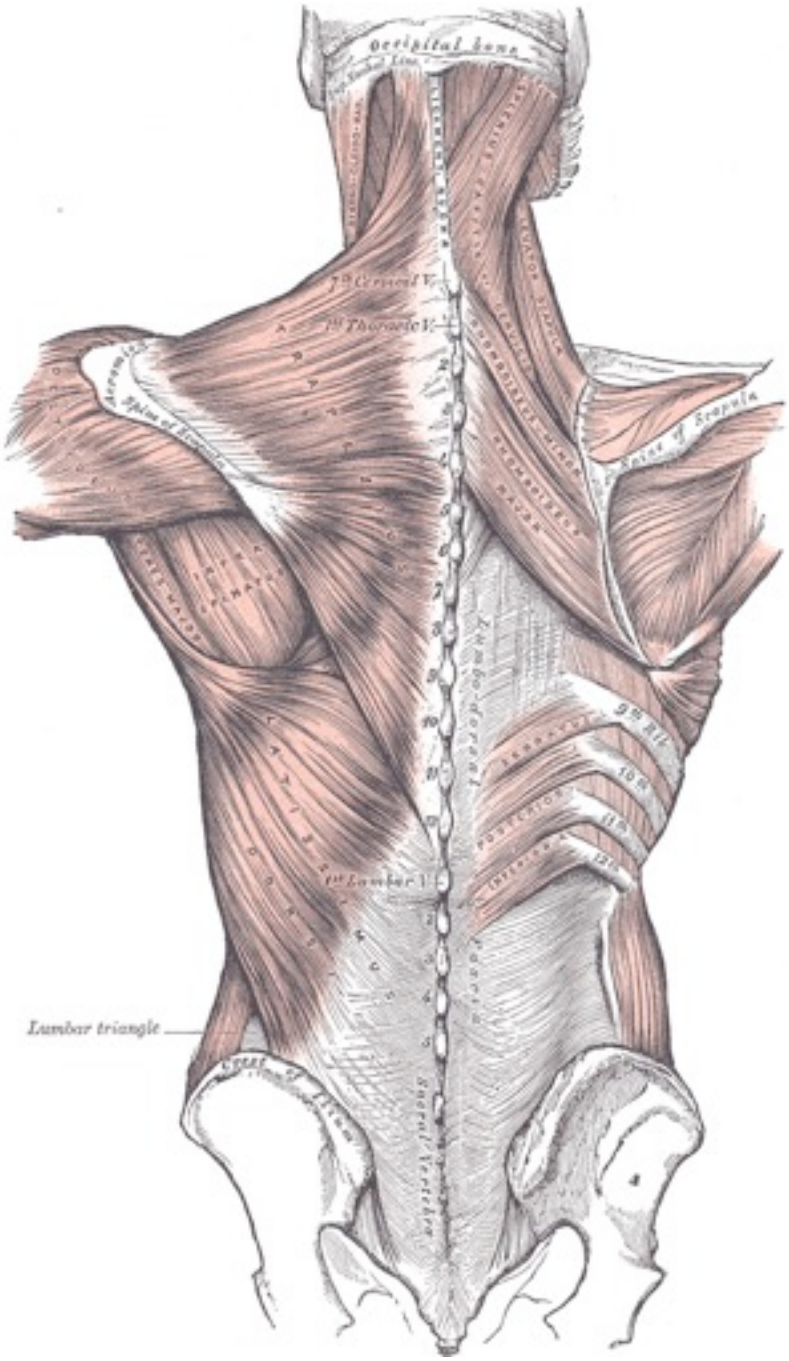
APPENDIX 1

This Appendix includes images of the musculoskeletal system of the human anatomy. These illustrations are the most commonly muscle groups associated with playing both the violin and the viola. They were taken from *Anatomy of the Human Body*, 20th ed., by Henry Gray, and are useful for further study.

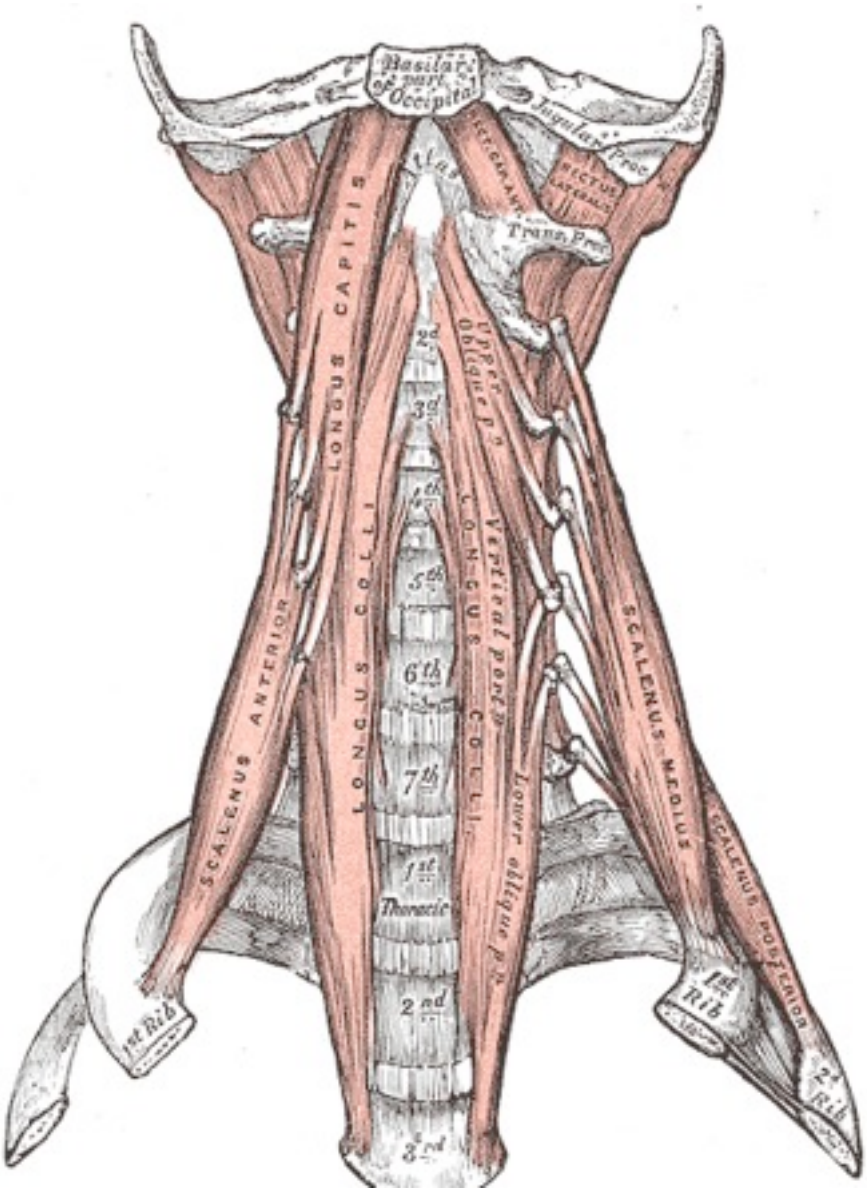
Muscles of the head, face, and neck.



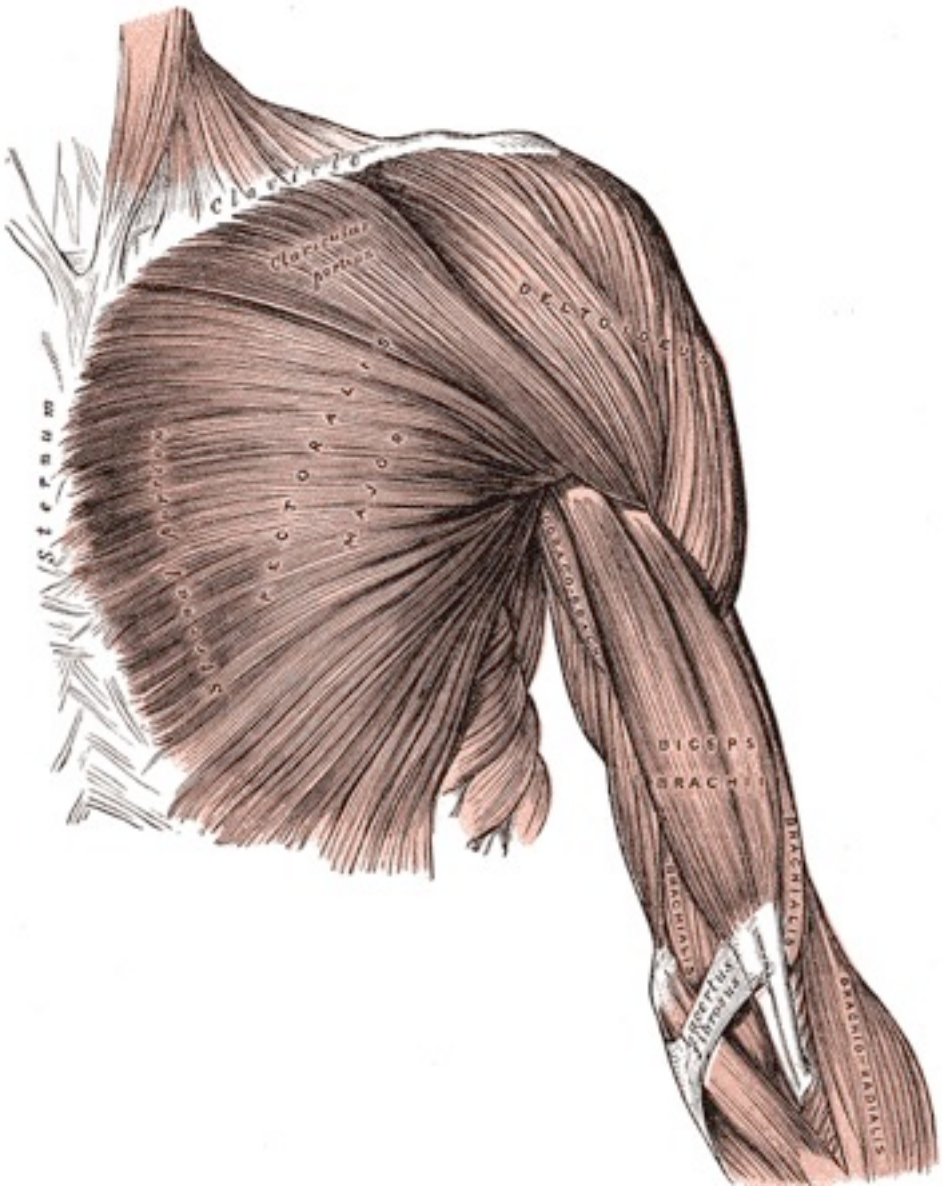
The anterior vertebral muscles.



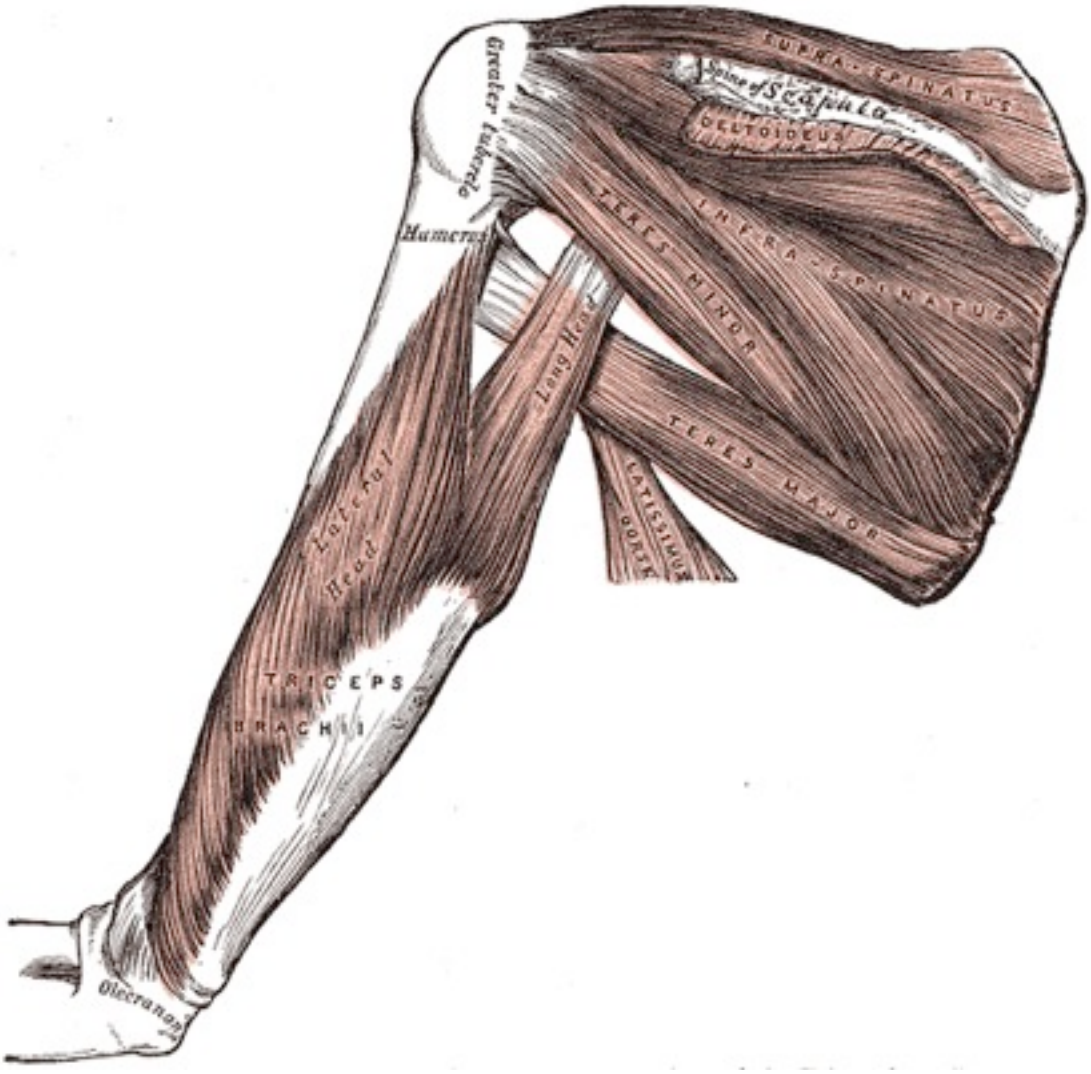
Muscles connecting the upper extremity to the vertebral column.



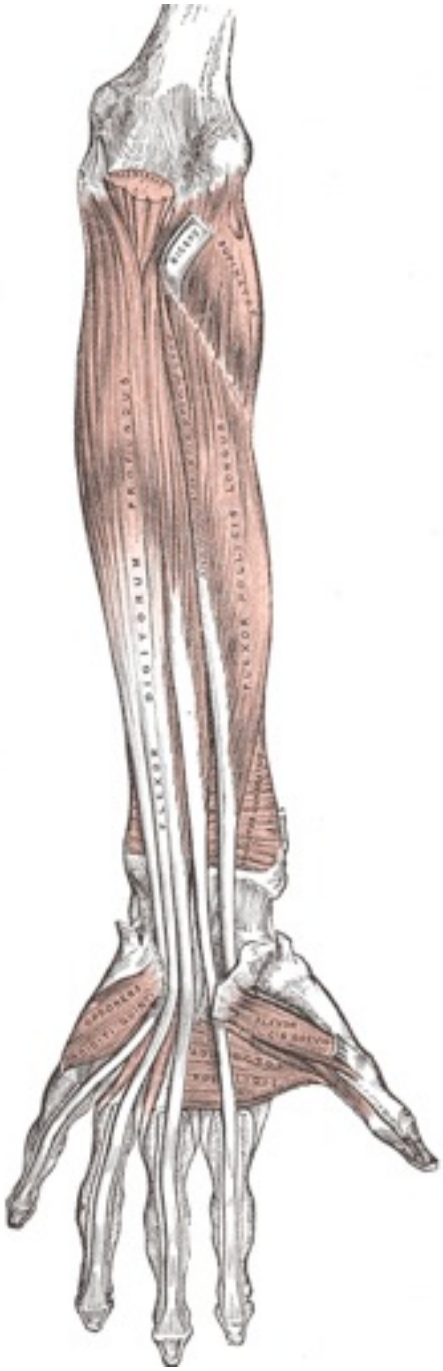
Superficial muscles of the chest and front of the arm.



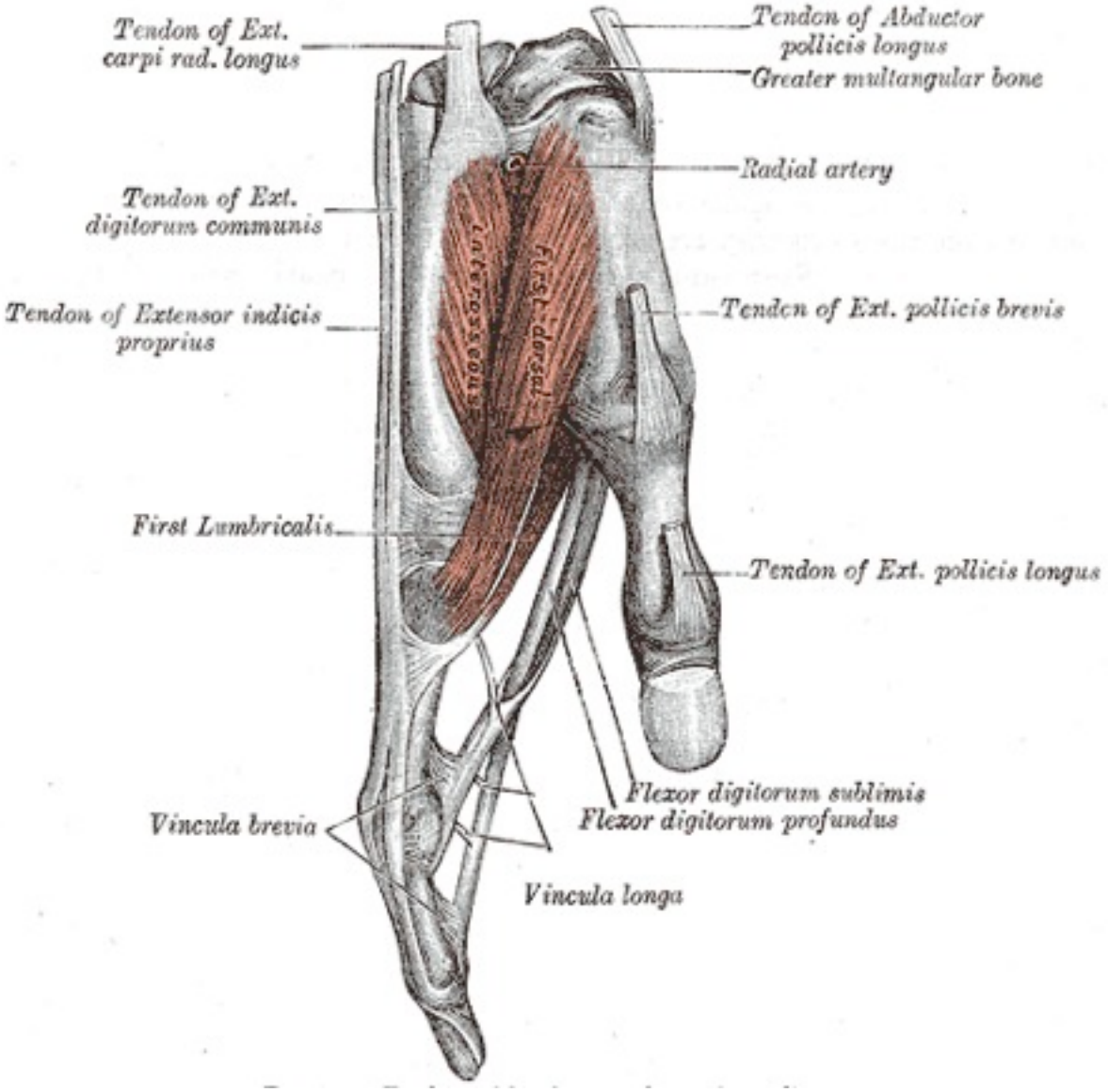
Muscles on the dorsum of the scapula, and the Triceps brachii.



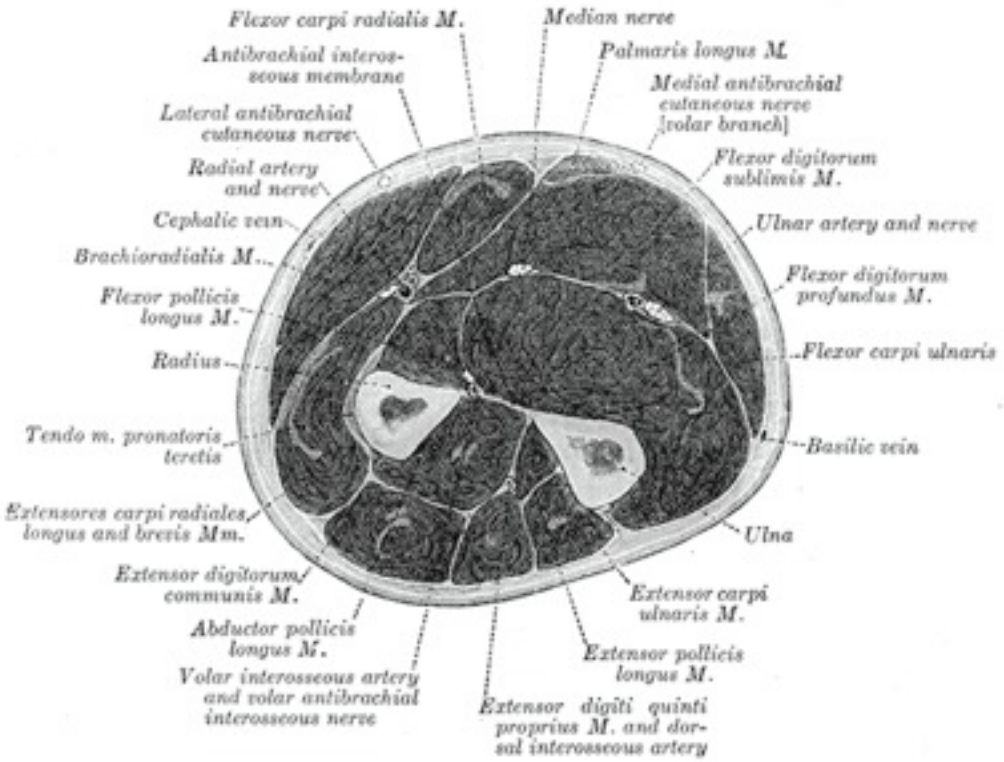
Front of the left forearm. Deep muscles.



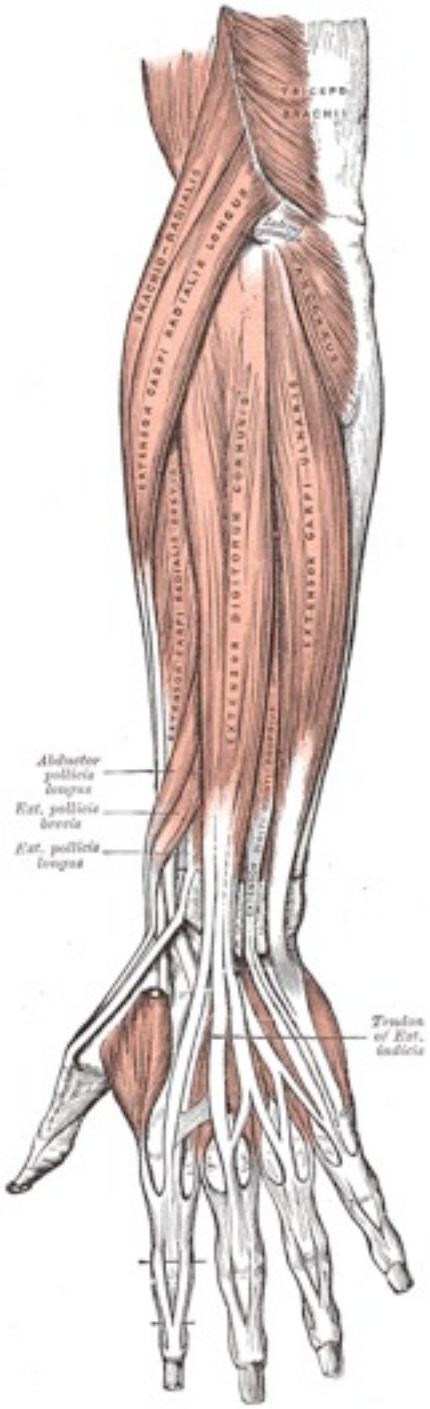
Tendons of forefinger and vincula tendina.



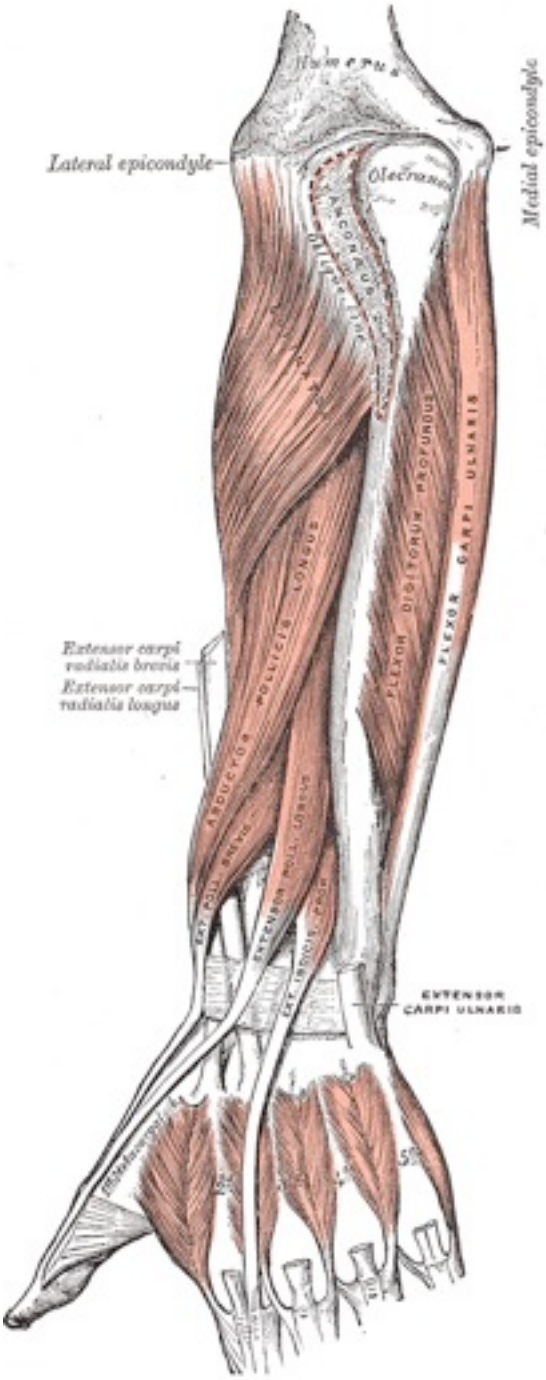
Cross-section through the middle of the forearm.



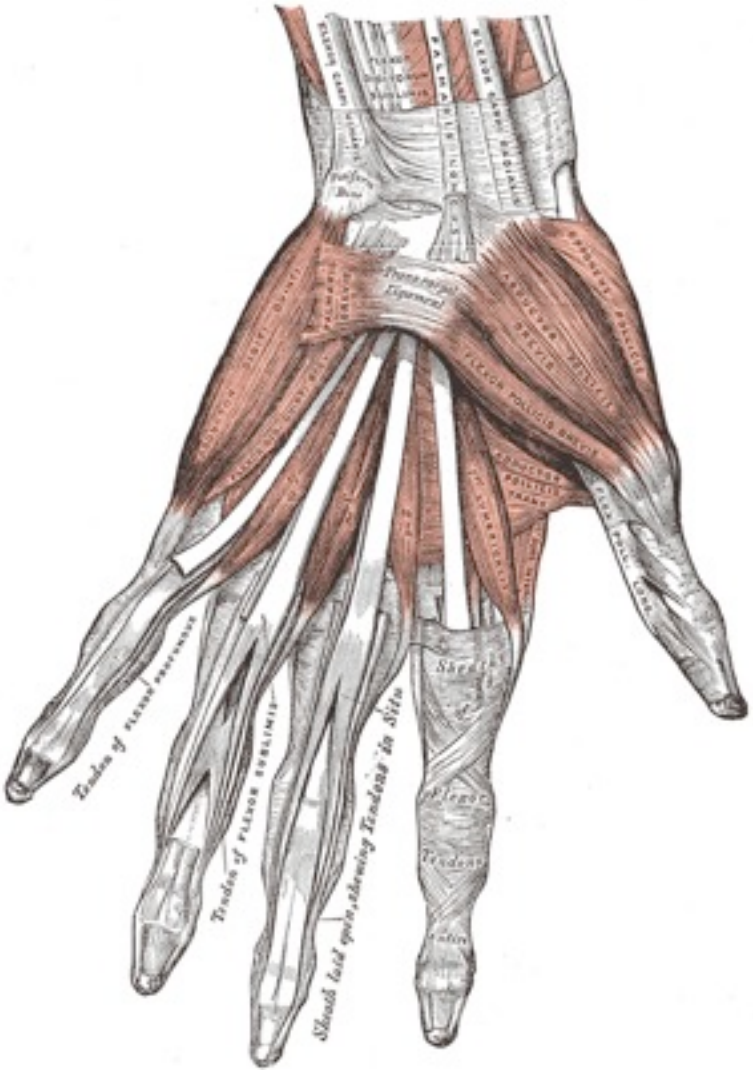
Posterior surface of the forearm. Superficial muscles.



Posterior surface of the forearm. Deep muscles.



The muscles of the left hand. Palmar surface.



APPENDIX 2:

Permission for Image Use

Permission requested from david@rivinus-instruments.com, on April 28, 2014.

From: david@rivinus-instruments.com
Subject: **Re: Permission for image use**
Date: April 28, 2014 6:58:11 AM CDT
To: Matthew Watts <dr.matthew.a.watts@gmail.com>
1 Attachment, 23.2 KB Save Quick Look

Hello, Matthew,

You are welcome to use the image of the Pellegrina viola from my website, on two conditions: Please credit me as the maker, and please refer to the instrument by its name: Pellegrina viola.

Good luck on your dissertation.

David

Sent from Windows Mail

Permission requested from iizukaviolas@verizon.net, on April 27, 2014.

From: Hiroshi Iizuka
Subject: **sample pictures**
Date: April 29, 2014 9:37:49 AM CDT
To: Matthew Watts <dr.matthew.a.watts@gmail.com>
5 Attachments, 189 KB Save Quick Look

Hello,
Attached are several photos I've taken of my instruments over the past few years. There are 3 different models that I am making. One ornate one is based on my original 1979 model. The da gamba style one is my current model. The round-shouldered one is I call my "rubenesque" model, which I is requested half of the time.
You are welcome to use any of them.
Once you've finished your thesis, I would be interested in reading it if possible.
Hiroshi Iizuka

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Subject: **Re: Permission for use of images**
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Thanks for your note.

Generally it is not necessary to get permission for use of materials for educational purposes.

Sincerely,

Steven van Leeuwen
President, Bartleby.com, Inc.