

COPELAND, SHAWN L., D.M.A. *Applied Anatomy in the Studio: Body Mapping and Clarinet Pedagogy*. (2007)

Directed by Kelly Burke and Marsha Paludan, 83 pp.

Current literature in clarinet pedagogy does not accurately and sufficiently describe the coordinated use of the body in the act of clarinet playing. Some sources are dated while others present inaccurate anatomical and physiological information. Body Mapping is a supportive study associated with the teaching of the Alexander Technique, developed by William Conable. Recently, many sources have been published relating to the study of Body Mapping. These new sources are available to teachers who are interested in incorporating Body Mapping into their pedagogy. To date, no source specifically relates Body Mapping to clarinetists or clarinet teaching. The purpose of this research was to adapt existing information on Body Mapping, making it specific to clarinet teaching and performance.

A thorough survey of existing literature relating to clarinet pedagogy and Body Mapping has been conducted. Specific fallacies and errors have been identified within the pedagogical literature, with emphasis on breathing, sitting and standing with balance and supporting the clarinet. Body Mapping information has been adapted to address the specific pedagogical needs of clarinet players and teachers. This adaptation was conducted through close analysis of Body Mapping and anatomy texts and includes anatomical sketches, drawings and pictures.

**APPLIED ANATOMY IN THE STUDIO: BODY MAPPING
AND CLARINET PEDAGOGY**

by

Shawn L. Copeland

A Dissertation Submitted to
the Faculty of The Graduate School at
The University of North Carolina at Greensboro
in Partial Fulfillment
of the Requirements for the Degree
Doctor of Musical Arts

Greensboro
2007

Approved by

Committee Co-Chair

Committee Co-Chair

© 2007 by Shawn L. Copeland

To my parents, Sadie and Jerry Copeland, for your love, guidance and continued support in my life. To my sisters, Sonya, Shelley and Stacey, and friends Michele and Jeff, for your love, support and attendance at all of my recitals. To Kevin Ravak for your encouragement to begin this journey, support and laughter throughout this journey and your presence in my life.

APPROVAL PAGE

This dissertation has been approved by the following committee of the Faculty of
The Graduate School at The University of North Carolina at Greensboro.

Committee Co-Chairs

Committee Members

Date of Acceptance by Committee

Date of Final Oral Examination

ACKNOWLEDGEMENTS

I would like to thank Dr. Kelly Burke, mentor and Co-Chair of this committee, for your creativity, guidance and insistence on quality and excellence throughout this degree. You continue to be a teacher, mentor and personal friend. Without your encouragement and support, this would not have been possible. You have made what I once thought impossible, a reality.

To Dr. Marsha Paludan, mentor, teacher and friend, thank you for sharing your work and introducing me to the work of Marjorie Barstow. You embody this work in all aspects of your life; your very presence in my life is freeing. Thank you for your smile in all those times when I faltered. I look forward to a lifetime of collaboration.

To Ms. Sarah Dorsey and Dr. Welborn Young, thank you for your presence on this committee, your enthusiasm for this work and your assistance in the writing of this document.

I would also like to thank Barbara Conable for granting permission for the use of illustrations from *What Every Musician Needs to Know About the Body* and *The Structures and Movement of Breathing*. These sources may be purchased from Andover Educators at www.bodymap.org. I would also like to thank David Gorman for the use of his illustrations from *The Body Movable*. This source may be purchased at www.learningmethods.com/bodymove.htm

Finally, to my students, both in clarinet and Alexander Technique, thank you for your patience, your work and our many discoveries.

TABLE OF CONTENTS

	Page
LIST OF FIGURES	v
DEFINITIONS.....	vii
CHAPTER	
I. INTRODUCTION	1
Background.....	1
Alexander Technique and Body Mapping	3
Research Need and Purpose.....	13
Procedure	14
Organization of the Text.....	14
II. SURVEY OF RELATED RESEARCH.....	15
III. BODY MAPPING IN THE CLARINET STUDIO.....	29
Lesson 1: Sitting and Standing: Body Mapping the Spine as the Principal Source of Support for the Body	30
Lesson 2: Supporting the Clarinet: Body Mapping the Shoulder Girdle, Arm and Hand.....	46
Lesson 3: Body Mapping the Structures and Movement of Breathing	56
IV. CONCLUSIONS	75
Conclusions.....	75
Recommendations for Further Research.....	78
BIBLIOGRAPHY.....	80

LIST OF FIGURES

	Page
Figure 1. The Spine.....	31
Figure 2. The Vertebra.....	32
Figure 3. The Spine as the Core.....	33
Figure 4. The Curves of the Spine	34
Figure 5. The Pelvis	36
Figure 6. The Right Half of the Pelvis.....	36
Figure 7. The Outside of the Pelvis	38
Figure 8. The Sacral Curve	38
Figure 9. The Leg.....	40
Figure 10. The Foot.....	41
Figure 11. Atlas and Occiput	42
Figure 12. The Atlas	42
Figure 13. Location of the A/O Joint.....	43
Figure 14. Weight through the Pelvis	44
Figure 15. Weight through the Foot.....	45
Figure 16. The Sterno-Clavicular Joint.....	47
Figure 17. Range of Motion.....	48
Figure 18. Front and Back View of Shoulder	49
Figure 19. Shoulder over Spine	49
Figure 20. Scapula	50

Figure 21. The Lower Arm	50
Figure 22. The Rotation of the Lower Arm	51
Figure 23. The Stability of the Lower Arm	52
Figure 24. Incorrect Mapping	52
Figure 25. Correct Mapping.....	52
Figure 26. Joints of the Hand.....	53
Figure 27. Joints of the Thumb	54
Figure 28. The Upper Respiratory System	57
Figure 29. The Rib Cavity, Front View	59
Figure 30. Location of the Lungs.....	60
Figure 31. The Rib Cavity, Back View.....	61
Figure 32. The Diaphragm.....	62
Figure 33. Diaphragm and Crura	63
Figure 34. Movement of the Ribs	64
Figure 35. Pelvic Floor	66
Figure 36. Coordinated Movement.....	67
Figure 37. Abdominal Cavity	69
Figure 38. Movement of the Spine	70

DEFINITIONS

Alexander Technique

“A simple and practical method for improving ease and freedom of movement, balance, support, flexibility and coordination. It enhances performance and is therefore a valued tool for actors, dancers and musicians. Practice of the Technique refines and heightens kinesthetic sensitivity, offering the performer a control which is fluid and lively. It provides a means whereby the use of a part – a voice or an arm or a leg – is improved by improving the use of the whole body.”¹

Body Map

“One’s self-representation in one’s own brain. If the Body Map is accurate, movement is good. If the body map is inaccurate or inadequate, movement is inefficient and injury-producing. Body Mapping is the conscious correction and refining of one’s Body Map to produce efficient, graceful, and coordinated movement.”²

Constructive Conscious Control

Constructive: because we are changing something in ourselves which is ineffective, harmful
Conscious: because we are becoming aware of what we are doing
Control: because we are redirecting energy and bringing freedom into our whole mechanism”³

Direction

“Thought in action.”⁴

“The process of projecting messages from the brain to the mechanisms and of conducting energy for the use of these mechanisms.”⁵

¹ Barbara Conable, and William Conable, *How to Learn the Alexander Technique: A Manual for Students* (Columbus OH, Andover Press, 1995), 1.

² , Barbara Conable, *What Every Musician Needs to Know About the Body: The Practical Application of Body Mapping to Making Music* (Andover Press: Oregon, 2000), 5.

³ As quoted by Marjory Barstow from her workshops in Australia. “Marjorie Barstow in Australia: The Workshops” *Direction: A Journal on the Alexander Technique*, 1, no 2: 41c.

⁴ Pedro de Alcantara, *The Alexander Technique: A Skill for Life*, (Crowood Press: Great Britain, 1999), 55.

⁵ Frank Pierce Jones, *Freedom to Change: The Development and Science of the Alexander Technique* (Mouritz Ltd: London, 1976), 210.

Downward Pull

“The pattern of tension in the whole body that originates with habituated tension in the neck muscles, thereby pulling the head down and back which ultimately has a destructive effect on the entire body. Downward pull interferes with or opposes the involuntary patterns that support and lengthen the body.”⁶

End-gain

The attempt to achieve a goal without any consideration of the means employed to attain the goal.

Inhibition

“Inhibition is receiving a stimulus to gain a certain end and refusing to react to it, thereby inhibiting the unsatisfactory habits of *use* associated with habitual reaction.”⁷

Means where-by

“The reasoned means to the gaining of an end.”⁸

Primary Control

“Primary control is the inherent and intrinsic mechanism for balance and support in the body. It assures that uprightness will be effortless and that movement will be supported and fluid. Primary control depends on the preservation of the recovery of a dynamic relationship between the head and the spine in movement or in stillness.”⁹

Unified Field of Attention

Awareness and attention to the whole self. (refer to *use* of the self)

Use of the (Whole) Self; Use

The manner in which one reacts with the whole body in any given situation, where all parts work together and no separate part (mind, body, spirit) exists independently of the others.

⁶ Barbara Conable, and William Conable, *How to Learn the Alexander Technique: A Manual for Students* (Columbus OH, Andover Press, 1995), 2.

⁷ F.M. Alexander as quoted by Marjory Barstow in William Brenner, “Practical Marj,” *Direction: A Journal on the Alexander Technique* 1, no. 2: 39.

⁸ F.M Alexander, *The Use of the Self* (Orion: Great Britain, 1985), 41.

⁹ Barbara Conable, and William Conable, *How to Learn the Alexander Technique: A Manual for Students* (Columbus OH, Andover Press, 1995), 1.

CHAPTER I

INTRODUCTION

Background

Traditional training of clarinetists generally addresses how to play the instrument. Teachers focus on technical development, theory, history and musicianship. Countless manuals and books have been written about each of these topics. The musical apparatus that is plucked, stroked, strummed, beaten, blown, or bowed is only half the instrument. “The other half is their body.”¹⁰ This concept is often overlooked in the training of musicians, particularly instrumentals. Clarinetists must learn how to use their bodies properly from the beginning of their musical education in order to avoid most performance related injuries.

Perhaps due to concerns about inadequacy or fear of losing their job, musicians have been reluctant to discuss physical problems associated with the practice and performance of their instruments. With the development of medical centers for performing artists, performers are beginning to reveal their conditions and seek treatment. In many instances, musicians are turning to the Alexander Technique for treatment.

The Alexander Technique teaches a free, balanced and efficient *use of the self*. The study of the Alexander Technique reveals habits of misuse, overuse, and tension

¹⁰ Carol Anne Jones, et. all, “Music and Medicine: Preventing Performance Injuries,” *Teaching Music* 9: issue 2 (October 1, 2001).

Habits of *misuse* exhibited in performance are often found to be prevalent in the daily activities of the individual.¹¹ The technique teaches a method for the discovery of these habits and a manner to develop more efficient, coordinated *use of the whole self*. Study of the Alexander Technique has allowed some musicians to regain use of their injured limbs and perform again. Others incorporate the Technique to conquer stage fright, improve breathing, develop stage presence and prevent fatigue or pain associated with practicing and performing. As evidenced by the growing number of Schools of Music with teachers of the Alexander Technique,¹² the study of the Alexander Technique is a growing trend for musicians.

Body Mapping is a supportive¹³ study associated with the teaching of the Alexander Technique, developed by William Conable, Professor of Cello at The Ohio State University. Body Mapping is applied anatomy: the practical application of anatomy to movement. Conable discovered that through Body Mapping sessions, students learn how an anatomical structure (arm, leg, etc.) relates to the functioning of the whole body. In a lesson, students explore the structure, location and function of the anatomical structure in question. As a result movement becomes fluid and flexible; and harmful habits of misuse are reduced. More importantly, the students' playing becomes efficient, free and expressive.

¹¹ By daily activities, I am referring to walking, eating, talking, working on the computer, anything not associated with the playing of a musical instrument.

¹² Julliard School, Appalachian State University, University of Colorado at Boulder City and Indiana University are a few schools that now have full time teachers.

¹³ As a supportive study, Body Mapping increases kinesthetic awareness, a skill necessary for the study of the Alexander Technique.

Barbara Conable has devoted much of her recent time and research to Body Mapping and the work of musicians. “What Every Musicians Needs to Know About the Body” is a seminar taught by her to musicians on Body Mapping. Through the work of Barbara Conable and Andover Educators, Body Mapping has become an effective teaching tool for re-educating musicians in their natural, coordinated patterns of movement. Through Body Mapping “students learn to question their conception of how they are designed with the reality of anatomical structure and how correcting inaccurate maps improves facility, ease and efficiency of body mechanics.”¹⁴ As a teacher of clarinet and the Alexander Technique, I incorporate concepts of the Alexander Technique and Body Mapping in my private lessons. I have found that while not all students respond to the principles of the Alexander Technique, Body Mapping is a simple and accessible learning process.

Alexander Technique and Body Mapping

Clarinet students often ask “What is the Alexander Technique?” and “Can the Alexander Technique help me?” The Alexander Technique is a method of discovering all that one has done to oneself that is creating tension or pain in one’s body and interfering with the coordinated *use of the whole self*. “It is a re-education in how you move and how you think about how you move.”¹⁵ The Alexander Technique can help anyone who is interested in using themselves more efficiently and freely, and anyone

¹⁴ Amy Likar, “Musicians as Movers: Body Mapping and the Alexander Technique for Musicians and Music Educators,” <http://www.bodymap.org/articles/artmusmovers.html>.

¹⁵ Dale Beaver, teacher of the Alexander Technique, Columbus, OH (December 31, 2004).

who is willing to apply the technique in their lives. This Technique is particularly useful to clarinetists because so much time is spent in the preparation for performance – practice or rehearsal, and often the conditions present are not the most advantageous for whole body thinking.

Frederick Matthias (F. M.) Alexander (1869-1955) was born in Tasmania, Australia. At a very young age, he achieved great success as a Shakespearean actor and orator. Early in his career, he developed a voice condition that interfered with his ability to perform. Essentially during a performance his voice would become hoarse and rough sounding. He was told by friends that his breath was audible, as if he was gasping for air. He sought the advice of several vocal coaches and physicians who recommended vocal rest and other remedies which he followed. Subsequently his voice improved until he began to act again at which time, the hoarseness returned.

F. M. recognized that in normal, daily *use*, his voice was fine. He also recognized that when he followed the advice of his doctors and coaches and did not use his voice his condition improved. Only when he spoke to act did the condition return. He surmised that his voice condition was the direct result of “something” that he was doing to himself in performance. He questioned his doctor who agreed but could not adequately determine what that “something” was. Determined to discover it from himself, F.M. decided not to act for a short time, but instead to study himself. This decision is perhaps one of the most significant points in the development of the Technique. F. M. took responsibility for his actions; he knew that his voice condition was the direct result of “something” he was doing.

F. M. set up a three-way mirror in his private space and began to observe himself for clues. He practiced normal speaking, general activities and reciting his lines. He soon discovered that when he began to act, he threw his head back and down, tensing the muscles of his neck and thereby putting stress on the larynx and breathing mechanism. Further experimentation and observation revealed not only was this affecting his vocal mechanism, it was causing a narrowing of his back and a shortening of his stature. He determined that simply moving his head in a slight forward and upward direction would relieve the downward pressure that was tensing his neck and back. The movement of the head also released the tension in his back and legs, greatly improving both the breathing and vocal mechanisms. This relationship, of the head to the neck and back, Alexander would later term *primary control*. This is perhaps the greatest discovery of the Technique. This understanding led F. M. to determine how greatly the manner in which the *use* of one part of himself affected the rest of his body. He was beginning to discover how intricately connected the mechanisms of the body were, and how *use* affected functioning - central components of the Technique.

F.M. thought he had solved it. He thought that if he simply moved his head forward and up, allowing his back to lengthen and widen, then he was right and he could act again. He followed his *directions*¹⁶ but when he observed himself again in the mirrors, he found that as soon as he began to recite his lines, he pulled his head back down to where he began. Disappointed, he decided not to speak but to continue to think of his

¹⁶ Directions in Alexander Technique refers to the mental suggestions: allowing the neck to be free in such a way that the head will move in a slightly forward and upward direction and the back will lengthen and widen.

directions. He determined that his habits had become so strong, and he was so unaware of them that changing them would require continual attention to his directions and awareness to his body. He developed a process to allow for this continual awareness. First he would think of speaking or reciting his lines. Only thinking about the action would allow time for him to notice his conditioned response to the stimulus – his *habit*. Second, he would abandon any idea of that action and return to his directions. This was necessary in order to inhibit the patterned response that he had learned – *inhibition*. Only after he was confident that he was directing, which he verified in the mirrors, would he then choose¹⁷ to either continue to direct, follow through with the initial action or employ an entirely new action such as lifting an arm – *Constructive Conscious Control*.

F. M. returned to his acting career successfully. He also began to teach his method as a vocal coach and later to patients who were referred to him from local doctors. For ten years, he experimented and observed himself and the effects of the Technique on those he worked with. Eventually he concluded:

1. The mind and the body are intricately connected
2. *Use* affects functioning
3. Sensory awareness of the body is faulty and unreliable
4. Conditioned responses to stimuli must be inhibited to allow for new pathways and opportunities for movement.
5. Continual directing – accessing primary control – allows for movement that is free and coordinated.

These principles along with those outlined above – awareness of habit, *inhibition* and *constructive conscious control* formed the foundation for what has become known as the Alexander Technique.

¹⁷ This element of choice is very important as it implies freedom to move without a patterned response, without habit.

At this time, F.M. was still in Australia working and teaching in Sydney. He began to show his work to others and soon attracted a good deal of attention. Physicians began sending patients with breathing conditions to him for treatment and he soon became known as the “breathing man.” F.M. decided that in order to spread his work, he needed to move to London, which he did in 1904. There he continued to teach his work and write. In an effort to further his work and support his findings he wrote and published a great many articles and his four books: *Man’s Supreme Inheritance*,¹⁸ *Constructive Conscious Control of the Individual*¹⁹, *The Use of the Self*²⁰ and *The Universal Constant of Living*²¹. Two of these books, *Man’s Supreme Inheritance* and *Constructive Conscious Control of the Individual* sparked the initial interest in the work for Marjorie Barstow.

Marjorie Barstow (1899-1995), was a Nebraskan-trained dancer who read two of F. M.’s books and was so intrigued with his work that she closed her teaching studio and went to London in 1931. She took lessons with F.M. for six months and then returned to the United States. Two years later, F.M. sent a letter to Barstow announcing that he was opening the first training program and invited her to participate. Barstow returned to London and trained with F.M. for three years. She became the first person to complete Alexander’s first teacher training course. She then returned to the U.S. and began teaching.

¹⁸ F. M. Alexander, *Man’s Supreme Inheritance*, (Mouritz Press: Great Britain, 2003).

¹⁹ F. M. Alexander, *Constructive Conscious Control of the Individual*, (Mouritz Press: Great Britain, 2004).

²⁰ F. M. Alexander, *The Use of the Self*, (Orion Books: Great Britain, 1985).

²¹ F. M. Alexander, *The Universal Constant of Living*, (Mouritz Press: Great Britain, 2000).

By the summer of 1971, Barstow had entered semi-retirement. She was asked to teach a workshop at Southern Methodist University but was quite reluctant to accept. After the urging of a former student, she decided to accept the engagement, the results of which would radically change the way the Technique was taught. Here at the workshop, Barstow was faced with teaching over fifty students. She quickly adapted and began teaching group lessons.

This was a pivotal moment for the teaching of Alexander Technique. Traditional lessons were one-on-one with the teacher and student. In a traditional lesson, students may explore habits of misuse and apply the Technique through activities such as getting into and out of a chair, walking or table work. In a group lesson, the same type of activities may be explored, but each student has the opportunity to observe each other. Barstow discovered that students could learn just as much or more from observing the lessons of others. This change in teaching style combined with her unique approach to the Technique would bring Barstow out of retirement.

Barstow's practical style and her ability to teach large groups of people quickly attracted the attention of the growing community of teachers. Frequently she was asked to guest teach in training programs and workshops. The popularity of her summer workshops at her home in Lincoln, Nebraska increased as more students moved to the area to study with her. Although she did not think of herself as training teachers, she began to do just that. She shared the same thoughts as F.M.: you could not be trained to teach Alexander Technique because the Technique was not a traditional technique where you have prescribed methods of teaching or specific exercises to follow. Barstow

continued this tradition: you were ready to teach when your own *use* had developed to a certain point that you could continue in that *use* while you engaged in hands-on teaching with a student. The size of her workshops created the space for many students to have teaching opportunities under her supervision and guidance. This was very much an apprenticeship model of training.

The student responsible for encouraging Barstow to attend the workshop at Southern Methodist University was William Conable.²² Conable began his studies in the Technique with Barstow in 1962. He then studied with Frank Pierce Jones as a graduate student in Boston, MA. Jones learned the technique from F.M.'s brother, A.R. Alexander,²³ and was responsible for conducting the first scientific explorations into the Technique. In his book, *Freedom to Change: The Development and Science of the Alexander Technique*,²⁴ Jones discusses his experiments and findings. Conable then returned to study with Barstow in 1971, and worked with her for the next fifteen years. Barstow's practical teaching style and Jones's scientific explorations into the Technique made a lasting impression on Conable. This unique combination of teachers with contrasting approaches strongly influenced the development of Body Mapping which is the practical application of scientific information about the body to movement.

²² William Conable is currently the Professor of Cello at The Ohio State University.

²³ F.M. shared his discoveries with his brother A.R. and together they worked and trained teachers while in Boston, MA during the World War II. During this time, Marjorie Barstow and Frank Piece Jones met while working with the Alexander brothers in Boston. William Brenner, "Practical Marj," *Direction: A Journal on the Alexander Technique* 1, no. 2 (1987) reprinted on <http://www.ati-net.com/articles/dm-bill.php> (accessed March 26, 2007).

²⁴ Frank Pierce Jones, *Freedom to Change: The Development and Science of the Alexander Technique*, (Mouritz Press: London 1997).

Conable developed the process of Body Mapping as a supportive study to his teaching of the Alexander Technique. As an Alexander teacher, he was asked to observe the bowing movement of a violinist. His observations of the student's movement led him to believe that the student was moving her arm as if the elbow was approximately two inches above where it was actually located. He questioned the student about when she began playing the violin, and concluded that the student was still moving according to where her elbow was located when she first started playing the instrument. Essentially the map of the student's arm had not changed as she grew and matured, at least as it related to playing the violin. Within a few short moments Conable showed the student his observations, re-mapping the arm for the student. The student played again and moved with natural coordination, and bowing was improved.

Body Mapping is the study of one's body map and its relationship to movement. The body map is one's self representation in one's brain. During a lesson students study a specific structure – its location, size and function and how that specific structure contributes to the functioning of the whole body, in order to produce efficient, graceful and coordinated movement.²⁵ Body Mapping is applied anatomy. Conable's experience as a teacher of the Alexander Technique revealed that we move according to our own body maps. According to Richard Nichols, "If movement is based on an inaccurate knowledge or perception about the anatomy of the body, then pathologic changes can result."²⁶ We each have our own map that we learn and develop both consciously and

²⁵ Barbara Conable, "Body Mapping," <http://www.bodymap.org/bodymapping.html>.

²⁶ Richard Nichols, "Scientific Basis of Body Mapping," <http://www.bodymap.org/articles/artscientificbasis.html>.

unconsciously from the time that we are infants. “The maps that represent the anatomy of the body are clearly dependent upon the motor and sensory experiences of the individual.”²⁷ As we learn to move and discover how our bodies move and function, we are mapping.

Individual body maps are constructed in consciousness. They are created from the experience of movement and from touching and being touched. For a variety of reasons - inaccurate interpretation of information, erroneous pictorial or verbal information, imitation of others, and rejection of various body parts or pure fantasy - our maps may be faulty or incorrect. When we mature and go through the awkward stages of puberty, we often stop exploring the ways in which our bodies move. As a result, our own maps may not change to reflect our new adult bodies. Movements may become uncoordinated and clumsy. We move according to our old, faulty maps.

Body maps are learned over time and change over time. Because of this, changing or re-learning one’s body map is possible. Through Body Mapping sessions, students explore their own movement and their own map. In my own exploration of Body Mapping, with my clarinet students, I lead them through a discussion of a specific structure, asking them questions that will reveal their own perceptions of their anatomy. This is necessary to expose their faulty map. Students then observe how they, in fact, are moving according to their misconceptions. We then discuss the structure in question, often employing such tools as a skeleton or anatomical charts and drawings. The student explores how this new information informs their movement and the relationship of the

²⁷ Ibid.

part in question to the whole body. Students usually show an immediate change in *use*; their movements become more coordinated, easy, and efficient. This is why Body Mapping is such a useful supportive study to the Alexander Technique. It increases awareness of how the parts of the body relate to the whole, and with the deeper understanding of the parts, how the whole body can move with greater ease and efficiency.

F.M. believed that everyone was born with a beautifully coordinated *use of the whole self*. The Alexander Technique is a method for re-discovering that *use* that is built-in to the mechanism of the body. Body Mapping as a supportive study of the Alexander Technique is the practical application of anatomy to movement. It serves as a vehicle to understanding the structure and how the structure provides support and movement. It assists students in understanding how habits and misunderstandings have interfered with their coordinated *use*. It is the application of scientific, medical knowledge of the body, in a clear and practical manner, to movement.

Within the context of a clarinet lesson, Body Mapping has been most helpful in discussions of breathing, sitting and standing, supporting the instrument, embouchure and articulation. In all cases, I explore the various skeletal and muscular relationships associated in each of those activities, and work with each student to incorporate that information into how they play the clarinet.

Research Need and Purpose

Current literature in clarinet pedagogy does not accurately and sufficiently describe the coordinated *use of the whole self* in the act of clarinet playing. These sources are dated and present inaccurate information with regard to breathing, posture and supporting the clarinet. Many of these sources continue to present ideas of posture which lead to rigidity throughout the body and sometimes long term injury. Common myths about breathing continue despite current research to suggest otherwise. These sources are discussed in detail in the related research section, Chapter Two. Through Body Mapping, these myths can be removed from our pedagogy. The act of playing the clarinet and making music can be understood as the coordinated function of the whole body; the whole *self*.

Many new sources are available to teachers who are interested in incorporating Body Mapping into their pedagogy, but there is no source that specifically relates Body Mapping to clarinetists or clarinet teaching. The purpose of this research is to adapt existing information on Body Mapping, making it specific to clarinet teaching and performance. This study will seek to answer the following research questions:

1. How can Body Mapping be used as an effective teaching tool in the clarinet studio?
2. What are common errors of the body map that affect clarinetists?
3. What common mapping errors exist in the literature of clarinet pedagogy?

Procedure

A thorough review of existing literature relating to clarinet pedagogy and Body Mapping was conducted. From this review, specific fallacies and errors were identified within the clarinet pedagogical literature. Currently available Body Mapping texts were then adapted to address the specific pedagogical needs of clarinet players and teachers. This adaptation was done through close analysis of body mapping and anatomy texts and includes anatomical sketches and pictures.

Organization of the Text

Chapter I contains a brief introduction, brief biographical information on F.M. Alexander, William and Barbara Conable, and an explanation of Body Mapping and Alexander Technique, the problem statement, the research purpose and questions and methodology. Chapter II contains a survey of related research. Chapter III contains Body Mapping discussions on the topics of sitting and standing with balance, supporting the clarinet and breathing. Common fallacies and errors are discussed. Chapter IV contains the research conclusions and suggestions for continued research.

CHAPTER II

SURVEY OF RELATED RESEARCH

In surveying literature related to the teaching and playing of the clarinet, many sources discuss historical development, selection of instruments, repertoire, reed adjustment or preparation, practice techniques and fingerings as well as teaching methods and artistic suggestions for passages in the repertoire. Of the topics related to the body such as breathing, posture and support of the instrument, breathing was the primary topic discussed by most of the sources surveyed. A few sources briefly mentioned the use of the body in practicing or performing and a few discussed how to hold the instrument. Most authors discussed breathing through the use of metaphor, stating what good breathing should “feel” like. Very little if any description of the anatomical structures is provided and sketches or drawings were entirely absent. Of all the topics surveyed, the discussions on breathing were the most specific, however in most cases, the anatomical references or information given was inaccurate.

Rudolph Dunbar in *Treatise on Clarinet* (1939)²⁸ mentions posture when playing the clarinet. He states that the arms and wrists should hang from the body naturally, free of tension. He describes specific placement for each finger over each tone hole. He concludes by stating that you should feel comfortable and if one is noticing tension to simply ask yourself what is wrong and work to discover the error. In his short discussion

²⁸ Rudolph Dunbar, *Treatise on the Clarinet*, (Dallas & Sons Ltd: England, 1939).

on breathing, Dunbar mentions that for a clarinetist “the correct breathing process is from the abdomen or rectus abdominis.”²⁹

In addition to historical information and general information on embouchure, reeds, and playing, breathing is the only aspect related to the body discussed by Gabriel Tosé in *Artistic Clarinet: Technique and Tone* (1962).³⁰ In this brief section, Tosé advocates pushing upward with the diaphragm, as well as a visible movement upward in the stomach muscles on the exhalation.

The Art of Clarinetistry (1965)³¹ by William Stubbins is a scientific approach to the clarinet. This text covers reed making, acoustics, tuning, tone, and musicianship. There is a thorough discussion on respiration with accurate anatomical information given, though pictures or drawings are not provided. Stubbins also presents a detailed description of holding the clarinet. Here he gives very specific directions on placement using angles for the fingers and the clarinet. For each finger he describes placement, approach to the instrument and which keys it should touch or activate. Photographs of his hands on the clarinet are included, however there is no discussion on how the hands relate to the arms and body.

Robert Willaman in *The Clarinet and Clarinet Playing* (1954)³² discusses all aspects of clarinet playing including musical instruction. From the selection of the instrument, reeds, mouthpieces and care and assembly of the instrument to reading music

²⁹ Ibid., 25.

³⁰ Gabriel Tosé, *Artistic Clarinet: Technique and Study*, (Highland Music Company: California, 1962).

³¹ William H. Stubbins, *The Art of Clarinetistry*, (Ann Arbor Publications: Michigan, 1965).

³² Robert Willaman, *The Clarinet and Clarinet Playing*, (Carl Fischer: New York, 1954).

and playing artistically, this volume is extensive in its information. In chapter five, “Preparations for Playing,” Willaman advocates a practice routine that shifts between sitting and standing, stating that public performance requires both. He suggests practicing repetitive passages while walking around a room, staying in motion in order to stay relaxed. Willaman also advises the student to lean slightly forward while sitting and standing, claiming this will free the abdominal muscles from supporting the torso and allow them to assist with breathing. Willaman’s discussion of breathing is simple. He mentions that babies learn to breathe naturally the instant they are born and the only difference between this natural breathing and playing the clarinet is that you blow into the clarinet. Willaman describes the process of holding the clarinet as placing the right thumb under the thumb rest and gripping the clarinet with the first two fingers.

Keith Stein presents a discussion on hand position in *The Art of Clarinet Playing* (1958).³³ In his presentation, he describes the particular placement of each finger including the right thumb under the thumb rest. Notable is Stein’s understanding of the relationship of the shoulder, elbow and wrist and their effect on the movement of the fingers. Stein relates the entire arm structure to finger movement and freedom in the fingers and wrists. This is all correct, but he fails to mention how the clarinet is supported by the body and describes the thumb as having only two joints. Stein uses metaphor to describe what good breathing and support should “feel” like. There is very little mention of the anatomical structures of breathing; however he does make reference to the diaphragm’s role in exhalation as being one that is controlled and active, creating

³³ Keith Stein, *The Art of Clarinet Playing*, (Summy-Birchard Company: Illinois, 1958).

support for the air stream. He also suggests that the upper chest and shoulders should not move and students should attempt to concentrate the air in the lower rib cavity. Worth mentioning is Stein's view on tension and the body. Throughout the entire book, Stein stresses the need for relaxation and freedom in the body while playing. He offers suggestions and exercises for achieving such freedom. He explains that tension in one area such as the right wrist will inevitably lead to tension throughout the arm and shoulder and eventually the neck, face and embouchure. This idea follows F.M. Alexander's idea concerning *use* and functioning – the use of one part affecting the functioning of the whole body.

Clarinet Performing Practices and Teaching in the United States and Canada (1973),³⁴ by Cecil Gold, is a compilation of what was occurring in clarinet pedagogy at the time. A survey of 162 clarinet teachers was conducted and the results compiled in this document. The question topics range from literature recommendations to playing characteristics and reed selection. There is no mention of breathing, posture, hand position or the pedagogical manner in which these topics are covered in the studio.

In *Clarinet* (1976)³⁵, Jack Brymer discusses the historical development of the instrument. He also offers pedagogical suggestions and artistic discussions on successfully accomplishing some passages which are particularly difficult on the clarinet. Throughout the book there are small discussions on breathing and positioning of the clarinet. At no time does Brymer discuss the anatomy involved, but merely offers

³⁴ Cecil Gold, ed., *Clarinet Performing Practices and Teaching in the United States and Canada*, (University of Idaho: Idaho, 1973).

³⁵ Jack Brymer, *Clarinet*, (Kahn & Averill: London, 1990).

suggestions from a pedagogical approach to dealing with issues related to these topics. In each of these sections, he clearly states that each student is different and it is necessary to find out through trial and error what will work for each student.

In *The Clarinetist's Companion* (1976),³⁶ Pamela Weston presents a complete musical guide to the clarinet, including historical information, instrument selection, rhythm, musical interpretation and ornamentation as well as basic components of playing and teaching the clarinet. Of particular note is her discussion to the teacher on tension in the student. She suggests many clues as evidence of tension in the body such as fingers being held high off the keys, frowning, harsh tone and choked high register. Weston indicates that these symptoms are indications of global tension rather than localized tension and makes a few suggestions of remedies. For a playing position, Weston suggests a pupil to remain seated to avoid fatigue. She recommends that students sit away from the back of the chair and slightly forward to keep the air from having to go “up hill.”³⁷ In her description of holding the clarinet, Weston delineates between finger placement and support. She discusses finger placement and a process of bringing the hands to the instrument while the clarinet is being supported by the knee. Only after the fingers have been placed over the keys is the right thumb placed under the clarinet, engaging the support mechanism. There is no mention of how the hands relate to the arms and body and connecting the support of the clarinet back to the spine.

³⁶ Pamela Weston, *The Clarinetist's Companion*, (The Chaucer Press: Great Britain, 1976).

³⁷ *Ibid.*, 40.

In the introduction to Weston's discussion on breathing she states that while it may not be necessary for the student to know, the teacher must have a full grasp of the breathing process in order to properly teach and assist the student. She then describes the process, separating the inhalation from the exhalation. This process requires the clarinetist to keep their ribs up, in the inhaled position through the process of the exhalation, only bringing them down at the last moment, or during a rest. This process must be adhered to even if there is pain associated, as she indicates this pain is temporary and will subside. She also advocates not moving the shoulders as this creates tension in the throat and neck areas. Weston does not use pictures or diagrams in any of her discussions.

Frederick Thurston devotes an entire chapter to a discussion on breathing in *Clarinet Technique* (1977).³⁸ His philosophy on breathing suggests that when playing the clarinet, breathing should be natural and uninhibited. Thinking about it too much interferes with that natural process. He then continues to describe the process in detail. He describes the position of the diaphragm in its resting state as domed in the chest, but the position he describes for the contracted state is "at the waist." He also claims the diaphragm is the controlling muscle of exhalation. In an effort to take in breath at full capacity he indicates that the lower lungs must fill with air, but not to move the upper chest, shoulders or arms. He briefly mentions the manner in which one should play the clarinet, "Stand up straight with the body thoroughly relaxed..."³⁹

³⁸ Frederick Thurston, *Clarinet Technique*, (Oxford University Press: London, 1977).

³⁹ *Ibid.*, 1.

Rosario Mazzeo in the *Clarinet: Excellence and Artistry* (1981)⁴⁰ gives no explanation of breathing, hand position or posture other than to say that usually when mistakes are made, addressing the air stream will immediately improve the situation.

Chapter one of Leon Russianoff's *Clarinet Method* (1982)⁴¹ is his approach to breathing and teaching breathing to students. Russianoff does not discuss the anatomy of breathing other than mentioning the diaphragm. Because of this, one must make those connections outside of the text. In both his discussions on the movement of breathing and on breath support, he suggests that clarinetists push their abdomen outward *before* breathing in, creating room for the lungs to expand and to press downward on the diaphragm.⁴² Russianoff also suggests that one should feel the expansion of the abdomen, sides and back as you exhale. In regard to hand position, Russianoff offers exercises for learning to “grip” the clarinet but not how to support the instrument. There is no mention of arms, or use of the whole body.

The Clarinet and Clarinet Playing (1983)⁴³ by David Pino is a thorough look at the clarinet from both a historical and mechanical perspective. In chapter four, “The Two Basics of Clarinet Playing,” Pino discusses airflow and relaxation. Within his explanation of airflow, he separates between breath support and wind speed. He uses extensive metaphors to describe how the student should feel, using minimal anatomical

⁴⁰ Rosario Mazzeo, *The Clarinet: Excellence and Artistry*, (Alfred Publishing: USA, 1981).

⁴¹ Leon Russianoff, *Clarinet Method, Bk. 1*, (Schirmer Books: New York, 1982).

⁴² *Ibid.*, 2.

⁴³ David Pino, *The Clarinet and Clarinet Playing*, (Scribner's Sons: New York, 1983).

references. In the second half of this chapter, Pino advocates a free and efficient use of the body through the use of the word relaxation – the absence of tension.⁴⁴ In either of these discussions, very little reference is made to anatomy, and there are no pictures.

In *The Cambridge Guide to the Clarinet* (1995),⁴⁵ Colin Lawson presents all aspects related to the development and teaching of the clarinet. This source is a collection of commissioned essays on various topics from historical development of the instrument, the various instruments of the clarinet family, teaching and repertoire as well as contemporary techniques and professional advice. Each essay is written by prominent performers or teachers in the field. In his essay “The Mechanics of Playing the Clarinet,” author Antony Pay discusses breathing, tongue position, articulation, hands, embouchure, and intonation. Pay discusses the diaphragm and the problems associated with this muscle and teaching the clarinet. He presents his ideas about abdomen-diaphragm opposition - the diaphragm resisting the abdominal muscles. He describes the effect of this as accomplishing a crescendo or decrescendo clearly by thinking, without any physical response; the abdominal-diaphragm opposition remains constant. This is an example of a complex metaphorical description for breathing that might be less confusing with a description of the anatomy involved, or anatomical drawings. In addition to breathing, other authors discuss tone, finger movement as associated with technical development and practice techniques. There is no framework or approach for the use of

⁴⁴ Ibid., 50.

⁴⁵ Colin Lawson, ed. *The Cambridge Companion to the Clarinet*, (Cambridge University Press: Cambridge, 1995).

the body in clarinet playing or teaching. The authors do not address how one should sit or stand in practice or performance, or how a student should hold the clarinet.

In *The Educators Guide to the Clarinet* (2000),⁴⁶ Thomas Ridenour does not address postural aspects of playing or the relationship of the hands to the body as they hold the clarinet. Ridenour does devote an entire first chapter to his views on breathing and its effect on playing the clarinet. He begins with a summary stating that breathing is most natural when we are sleeping and that we should continue this natural breathing in our clarinet playing. He describes two possible ways for the clarinetist to exhale – the “Diaphragmatic Method” and the “Compression Method.”⁴⁷ He advocates the second method, stating that the compression method produces a continuous cold air stream that is faster than what is produced from the diaphragmatic method. In his explanation of the compression method he suggests pushing down with the diaphragm and a spreading of the abdominal cavity through the exhalation.

From these sources surveyed, it is clear that a thorough discussion of the body’s role in clarinet playing is needed in the pedagogical literature. What information that does exist is either unclear or incorrect. Specific discussions are needed which accurately describe how to sit or stand with balance and support in order to allow the body to freely participate in the music making process. There has been almost no discussion on holding the clarinet. The topic of breathing must be explained with clear and concise descriptions

⁴⁶ Thomas Ridenour, *The Educator’s Guide to the Clarinet: A Complete Guide to Teaching and Learning the Clarinet*, (Published by the author: Texas, 2000).

⁴⁷ *Ibid.*, p. 2-3

of the anatomical structures involved. No longer should unclear or misguided metaphors be allowed to permeate the pedagogical literature.

Current research in Alexander Technique and Body Mapping is increasing. Although there are many books which introduce and describe the Alexander Technique, one book has been written that is particularly important for musicians. *Indirect Procedures* (1997)⁴⁸ by Pedro de Alcantara⁴⁹ is a practical application of the principles of the Alexander Technique for musicians. In addition to a full description of the Technique, Alcantara describes practicing through the *means-whereby* and highlights particular aspects of the Technique which are important to musicians. He includes discussions on how to apply the Technique to teaching, practicing and performing.

David Pino has written a series of articles in which he describes how Keith Stein approached playing and teaching the clarinet. Pino states in the opening of “The Clarinet Teaching of Keith Stein, Part One: The Relation of Posture and Balance to Clarinet Playing,”⁵⁰ that Stein had intended to write a second book, but never got to it. In this article, Pino describes Stein’s ideas on using Alexander Technique as a means for discovering freedom and relaxation in clarinet playing. Although Stein was not a teacher of the Alexander Technique, his presentation of the principles and concepts of the Technique is very thorough. He describes *primary control* and a means to discovering *primary control* in sitting, standing and playing the clarinet.

⁴⁸ Pedro de Alcantara, *Indirect Procedures* (Clarendon Press: England, 1997).

⁴⁹ Pedro de Alcantara is an Alexander teacher as well as a performing cellist.

⁵⁰ David Pino, “The Clarinet Teaching of Keith Stein, Part One: The Relation of Posture and Balance to Clarinet Playing,” *The Clarinet* 29, no. 4 (2002).

Brigitte Frick adapted the work of Thomas Fehr on the application of the Alexander Technique to flute playing in “Swiss Kaleidoscope.”⁵¹ Here the Technique is described in a simple and straight-forward manner. Although this article is more of an introduction to the Technique, suggesting the need for a teacher to give the full experience, the explanation offers enough information and procedures to entice the reader to want to learn more.

“Good Use in Instrumental Performance: The Alexander Technique,”⁵² by Ron Dennis, offers a short introduction to the Technique. Basic biographical information on F.M. is given along with what the Technique can offer a clarinetist. This article is very brief and serves only as an introduction to the Technique.

Several dissertations have been completed on the Alexander Technique. In *The Alexander Technique and the Pedagogy of Paul Rolland* (1996),⁵³ Carol McCullough compares violist Paul Rolland’s approach to technique, playing, and teaching style to the principles of the Alexander Technique. Carolyn Holm explores breathing hindrances in flute playing and how the Alexander Technique may be used to improve breathing in *Correctives to Breathing Hindrances in Flute Performance, with Emphasis on the Alexander Technique* (1997).⁵⁴ *Experience of Pianists who have Studied the Alexander*

⁵¹ Brigitte Frick, “Swiss Kaleidoscope,” *The Clarinet* 12, no. 3 (1985).

⁵² Ron Dennis, “Good Use in Instrumental Performance: The Alexander Technique,” *The Clarinet* 6, no. 3 (1979) p 26.

⁵³ Carol Porter McCulloch, *The Alexander Technique and the Pedagogy of Paul Rolland* (D.M.A. diss. Arizona State University, 1996).

⁵⁴ Carolyn Postma Holm, *Correctives to Breathing Hindrances in Flute Performance, with Emphasis on the Alexander Technique* (D.M.A. diss. The Southern Baptist Theological Seminary, 1997).

Technique (1994),⁵⁵ by Iris Kaplan is a case study of six performing pianists and their experiences with the Alexander Technique. In *Body Mapping: An Instructional Strategy for Teaching the Alexander Technique* (1999)⁵⁶ by Maribeth Knaub, twenty-five years of journals kept by students of William Conable (developer of the concept of Body Mapping) were selected, codified and categorized to reveal similarities and differences between how male and female musicians perceive and learn the Alexander Technique.

Although there are many books explaining the Alexander Technique, Alcantara's book is the only source to relate the Technique to musicians. The few articles that appeared in the *Clarinet* have introduced the Technique to clarinet players with the purpose of enticing readers to seek further information. To date, no dissertations or books have been written that apply Body Mapping or the Alexander Technique specifically to clarinet performance or pedagogy.

Literature in Body Mapping is quickly becoming more available due to publications by Barbara Conable and the Andover Educators. Conable has published three sources of particular interest to musicians. *How to Learn the Alexander Technique* (1995)⁵⁷ (also by William Conable) contains information about the Alexander Technique including a brief biographical sketch of F.M. Alexander. Also contained are several chapters devoted to specific systems and regions of the body (i.e. torso, legs and feet,

⁵⁵ Iris Kaplan, *The Experience of Pianists who have Studied the Alexander Technique: Six Cases Studies* (Ph. D. diss. New York University, 1994).

⁵⁶ Meribeth Jill Knaub, *Body Mapping: An Instructional Strategy for Teaching the Alexander Technique to Music Students* (Ph.D. diss. University of Pittsburgh, 1999).

⁵⁷ Barbara Conable, and William Conable, *How to Learn the Alexander Technique: A Manual for Students*. (Andover Press: Ohio, 1995).

arms, spine, breathing) and common mapping errors associated with those areas or systems. *What Every Musician Needs to Know About the Body: The Practical Application of Body Mapping to Making Music* (2000)⁵⁸ explores how musicians use specific parts of the body. Specific Body Mapping errors are identified and explored by correctly mapping each component and its function in the whole body. *The Structures and Movements of Breathing: A Primer for Choirs and Choruses* (2000)⁵⁹ explores Body Mapping as it specifically relates to breathing. Through many anatomical sketches, Conable explains the breathing mechanism in full detail. Although this text was written for use in choral education, it is an excellent source for information on the breathing apparatus.

Additional sources in Body Mapping include: *What Every Dancer Needs to Know about the Body* (2005)⁶⁰ by Robin Gilmore, *What Every Pianist Needs to Know about the Body* (2004)⁶¹ by Thomas Mark and *Body-Mapping for Flutists: What Every Flute Teacher Needs to Know about the Body* (2002)⁶² by Lea Pearson. These texts are adaptations of *What Every Musician Needs to Know About the Body*, made applicable to the given topic.

⁵⁸ Barbara Conable, *What Every Musician Needs to Know about the Body: The Practical Application of Body Mapping to Making Music* (Andover Press: Oregon, 2000).

⁵⁹ Barbara Conable, *The Structures and Movement of Breathing: A Primer for Choirs and Choruses* (GIA Publications: Chicago, 2000).

⁶⁰ Robin Gilmore, *What Every Dancer Needs to Know About the Body*, (Andover Press: Oregon, 2005).

⁶¹ Thomas Mark, *What Every Pianist Needs to Know About the Body*, (GIA Publications: Chicago, 2004).

⁶² Lea Pearson, *Body Mapping for Flutists: What Every Flute Teacher Needs to Know About the Body*, (Flutibia: Ohio, 2002).

Body Mapping and specifically Body Mapping for musicians is a growing field of research and literature. These sources present accurate, medical and scientific information regarding the body in such a way that it is easily understandable for teachers, and directly applicable to the use of the body in making music. It is clear that the existing literature in clarinet pedagogy lacks clarity with regard to breathing. The existing information presented is either inaccurate, or presented through the use of metaphors which are difficult to conceptualize for the student. This leads to a great deal of confusion for students. Thorough discussions on how to sit or stand when playing and how to support the clarinet freely to avoid injury are almost completely absent from the existing literature. These discussions are needed for clarinet players in order to avoid injuries that end careers. This information can be provided through the existing literature on Body Mapping.

CHAPTER III

BODY MAPPING IN THE CLARINET STUDIO

In this chapter, I will demonstrate the application of Body Mapping to clarinet pedagogy through a series of three suggested lessons addressing issues of sitting/standing with balance, supporting the instrument and breathing. Successful incorporation of this material is dependent upon the involvement of the whole body, therefore these lessons are intended to be a progression. Exercises should not be extracted from lessons two or three without first working through lesson one. The information for each lesson has been adapted from existing literature in Body Mapping to be relevant and applicable to the playing of the clarinet. This information is common medical knowledge; the intent is to be anatomically correct and introduce medical terms without being confusing. Due to the interrelatedness of the body, repetition of information is necessary and reinforces the learning process. Pictures and diagrams used in teaching have been included to assist in clarifying anatomical information in these written examples of incorporating Body Mapping into clarinet pedagogy.

Lesson 1: Sitting and Standing: Body Mapping the Spine as the Principal Source of Support for the Body.

Common Mapping Errors of Posture

In the teaching of posture, teachers commonly use the phrase “sit up straight” or “stand up straight with your chest up and shoulders back.” In an effort to follow these suggestions, students will push up along the spine in an attempt to straighten it and tighten the muscles of the back to pull the shoulders together. This postural set produces a rigid, military appearance and should be avoided. Holding this position for any extended period of time will produce a great deal of tension and muscle soreness and will lead to pain at the base of the skull, in the neck, upper and lower back and throughout the legs. Thinking of posture in this way is stationary and is not conducive to the music making process. It is necessary to think of posture, then, as a state of balance, always changing and in motion. Finding this state of balance requires an accurate understanding of the structures involved.

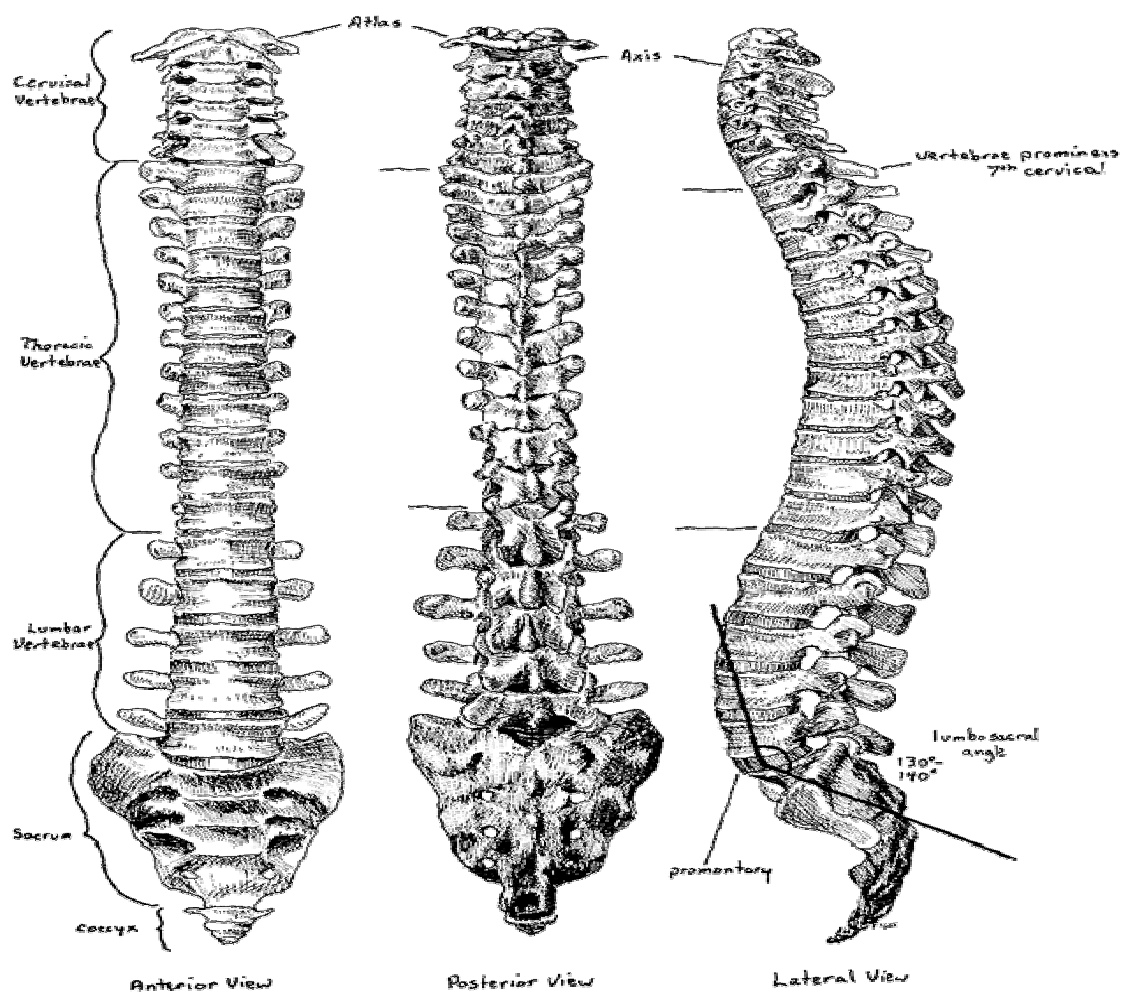
Clarifying the Body Map in Sitting and Standing

Because clarinetists spend so many hours sitting or standing during their preparation and performance, how they sit in the chair or stand can greatly affect how they use their body in the creation of their art. There are many fallacies concerning how to sit or stand correctly. Ideally, a clarinetist must find a way to balance over the core supporting structures of the body in such a way that the muscles are free to move and the body is poised for practice or performance.

The Spine

Sitting or standing with balance and freedom is not possible without first understanding the spine (see Figure 1. The Spine). The skeleton is the body's primary source of support, and the spine is the central structure of the skeleton. It is the core of the body, and the central mechanism for support. Clarinetists must understand the spine - its location, size and function - in order to sit, stand or move with balance and coordination.

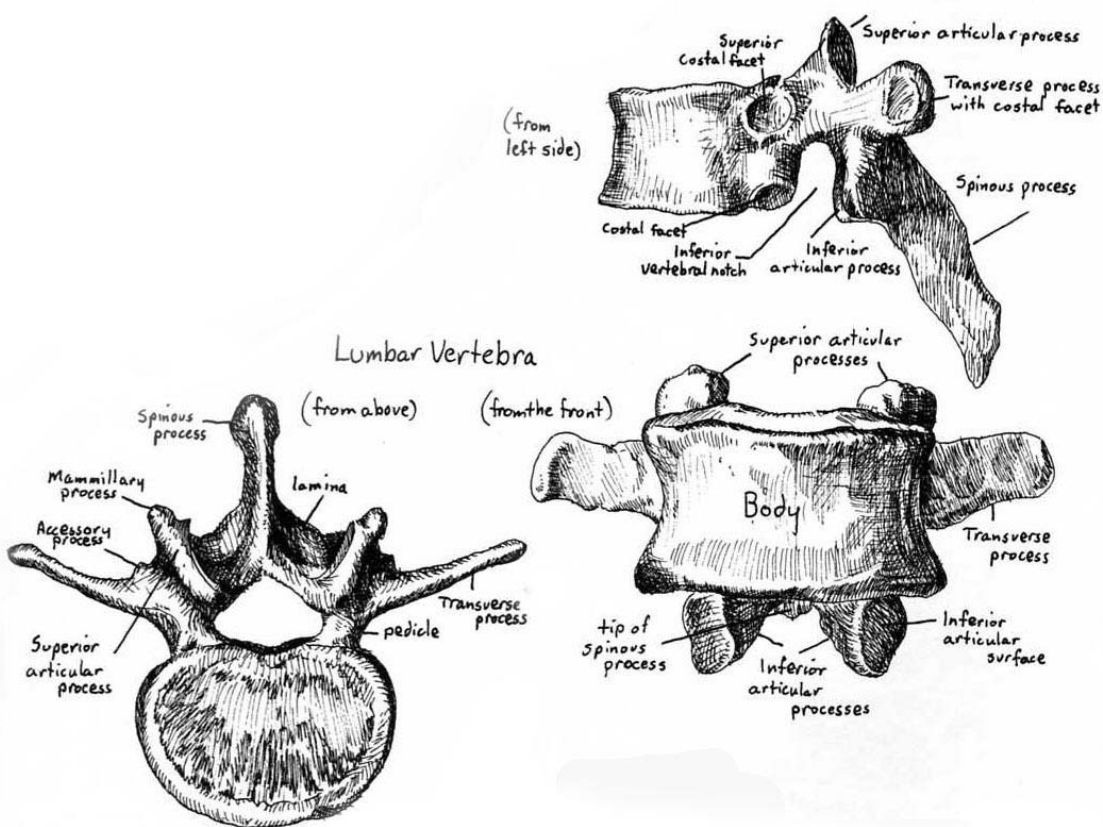
Figure 1. The Spine



The Vertebral Column

The spine is a dynamic and flexible structure. It is made up of seven cervical vertebrae (neck), twelve thoracic vertebrae (chest), five lumbar vertebrae (abdomen) and the sacrum (pelvis) (see Figure 1. The Spine). Each vertebra is separated by a disc that aids in shock absorption for the body. To examine a vertebra, (see Figure 2. The Vertebra) a

Figure 2. The Vertebra

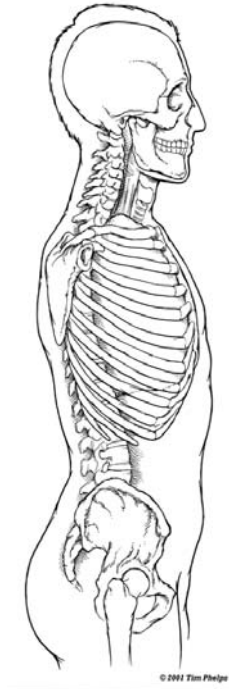


student will immediately notice they are thicker in the front and thinner in the back, and that as you progress down the spine, the vertebra dramatically increase in size to the largest, the lumbar vertebrae. Structurally, it is the front of the vertebrae that is intended to bear weight, not the thinner back side. This is why the discs are only in the front. The

thin back side of the vertebrae is intended to house and protect the spinal cord which brings nerve impulses from the brain to the organs and extremities.

In my experience, students think the bony processes along the back make up the spine, and often organize themselves accordingly. This brings the center of gravity of the body into the back rather than the center, putting weight and compression in the more

Figure 3. The Spine as the Core



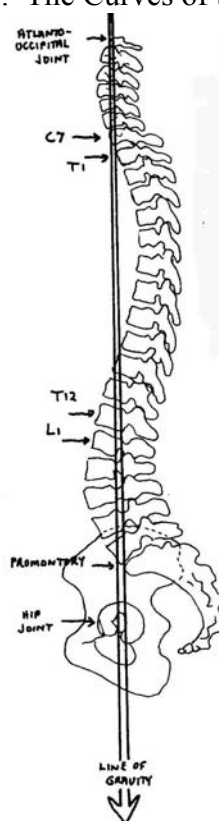
fragile area of the spine. Students who think of their spine in this way will usually stand with a good bit of weight on the heels of their feet. Often while standing, they will notice their knees locking and their lower back and shoulders overly tense. In this position, the muscles of the back must support the torso. “Backs are supported not supporting.”⁶³ A close examination of a skeleton or any anatomy book will reveal the location of the spine

⁶³ Barbara Conable, “What Every Musician Needs to Know About the Body”, seminar May 2005.

in relationship to the front and back of the body. The front, weight bearing area of the spine is more centrally located than most students realize (See Figure 3. The Spine as the Core). Clarinetists must map their spines as the center, core of their bodies so that the outer muscles may be free to move.

Spinal curvature can be a confusing topic for students. Ask any student to hold up fingers to indicate how many curves their spine has and you'll see anywhere from one to four and they will organize themselves accordingly. The spine has four curves – Cervical (neck), Thoracic (ribs), Lumbar (abdomen) and Sacral (pelvis). If you were to drop a

Figure 4. The Curves of the Spine



vertical line through the center of the body, this line would pass through the cervical curve, completely in front of the thoracic curve, through the lumbar curve and in front of the sacrum (see Figure 4. The Curves of the Spine). Both the thoracic curve and the sacrum curve back and away from this vertical line while the cervical curve and lumbar curves both turn into the vertical line.

Students are usually unaware of their sacrum and its relationship to the spine. The sacrum is the base of the spine, between the tailbone and the lumbar vertebra (see Figure 1. The Spine). Understanding this relationship is critical to experiencing the curves of the spine. Finding balance in either sitting or standing is contingent upon experiencing these curves. Since the sacrum is part of the pelvic structure, it is best to first illustrate its relationship to the pelvis.

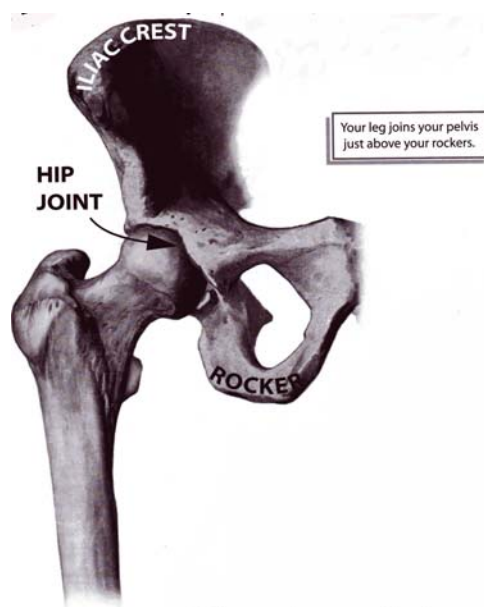
The Pelvis

The pelvis is the lowest structure in the torso. It is the base of the upper body. Structurally, the pelvis consists of two halves joined in the front by the pubic arch and in the back by the sacrum (See Figures 5 and 6). In both locations are joints making small movements possible. The ischial tuberosities (rockers or sits-bones) and the hip socket

Figure 5. The Pelvis



Figure 6. The Right Half of the Pelvis



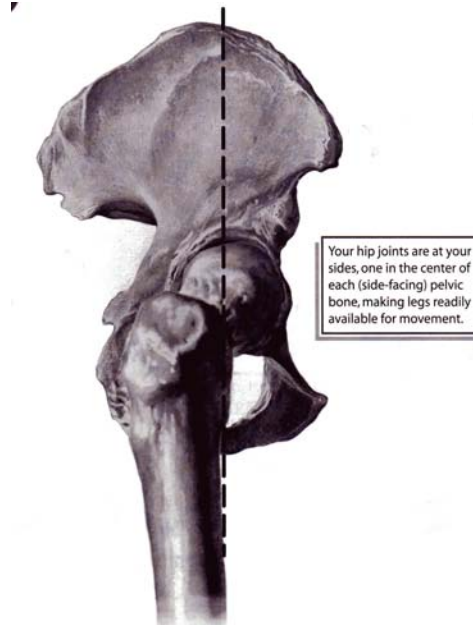
form the lowest structure and iliac crest form the upper structure (see Figure 6. The Right Half of the Pelvis). The sacrum is the curved structure that forms the back of the pelvis. It connects the lumbar vertebrae and the tail bone.

If you ask students to put their hands on their hips, they will often place them on the top of the iliac crest. This is the location of what the western fashion industry has dictated as the mid-line or “waist”. The waist is not the mid-line; in fact it is not even an anatomical structure. It is a construct of the fashion industry. This is an example of a faulty map, and causes and can create excessive tension in the hip joints.

Exercise:

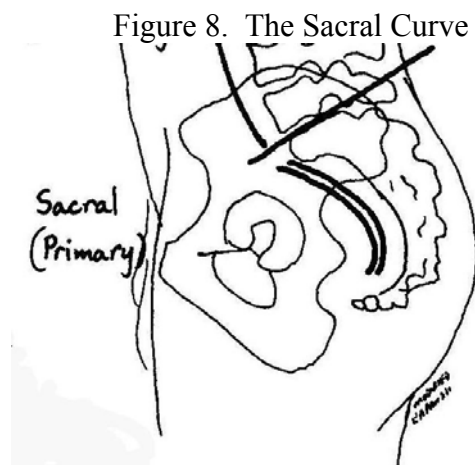
Sitting in a chair, begin to rock slowly side to side. Notice that you are rocking on two bones – the ischial tuberosities. These are your sitting bones; this is the base of the torso. Just above those bones are the hip sockets. This is where the legs meet the torso. These joints are located in the center of the pelvic structure, along the vertical axis of the spine and just outside the dense inner surface area of the pelvis (see Figure 7. The Outside of the Pelvis).

Figure 7. The Outside of the Pelvis



Once the hips are mapped correctly, a great amount of tension in the joints can be relieved. This will allow for full flexibility in the pelvis which is necessary to experience the depth of the sacral curve.

A quick glance at a skeleton or anatomy book will show that the sacral curve is quite sharp (see Figure 8. The Sacral Curve). At one point the angle of this curve is



very close to parallel to the floor. Many students rotate the pelvis back and in towards the body. This rotation distorts the relationship of the sacrum and pelvis to the rest of the spine, causing the other three curves of the spine to straighten. It also creates a good bit of tension through the hips, legs and lower back and greatly affects our ability to breathe.

Exercise:

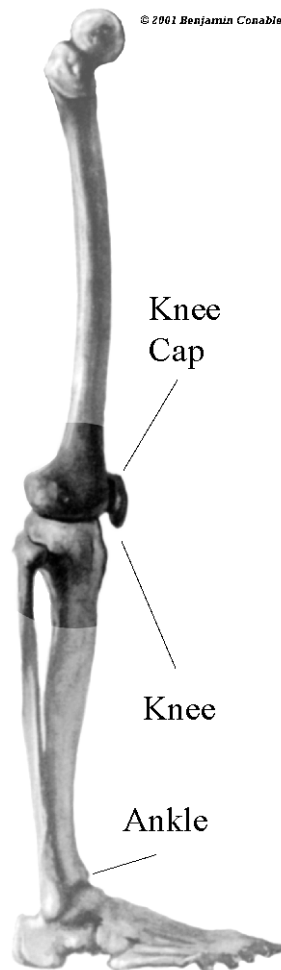
Students should experiment with different sacral placements (rotating the pelvis all the way forward and backward) paying attention to each placement's affect on the back, upper torso and legs. This should be done both sitting and standing. Afterwards, students can simply rock the pelvis forward and backward a couple of times and allow the structure to come into a neutral position where the knees are not locked and the lower back is free. When this is accomplished, the other three curves will quickly find their dynamically balanced relationship as described above.

The pelvis also serves as the primary structure for weight distribution between the upper and lower body. The outer surface areas of the pelvis are light in weight and thin in appearance (iliac crest) while the inner surface along the pubic arch is thicker and dense. As previously mentioned, the body is supported by the front surface of the spine, this weight is transferred from the spine, through the sacrum and into the dense, inner surface area of the pelvis. From there weight is either transferred down through the sitting bones into the chair (if one is sitting), or to the legs through the hip joint.

The Joints of the Leg: Hip, Knee and Ankle

A correct map of the knee and ankle joint is essential to balanced standing (see Figure 9. The Leg). If you ask a student to place their hand on either joint, you will

Figure 9. The Leg



usually find that a good majority will place their hands on their patella or knee cap for their knee joint and their fibula for their ankle joint. Many students will actually draw their legs with a right angle for their ankle joint. This thinking contributes to the

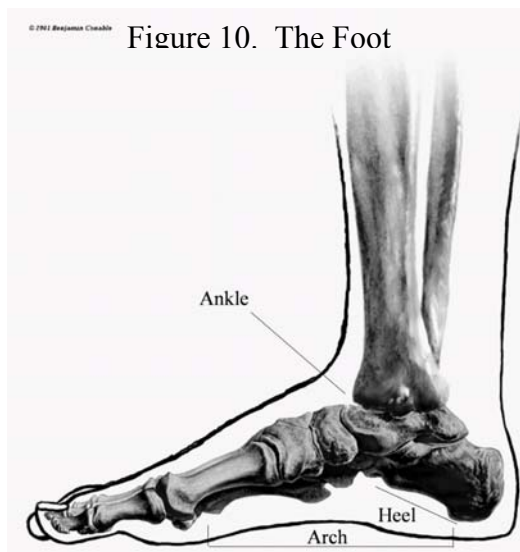
straightening of the spine and the placement of weight in the back rather than the center of the spine.

Exercise:

To locate the knee joint, sit comfortably in a chair and place the foot flat on the floor. The leg should be bent at a ninety degree angle. Locate the knee-cap with your hand. Notice that on either side of the knee-cap are large, round bony structures which form the base of the femur. Following the curve of these bones down and around you will find the place where the femur meets the tibia. This is the knee joint, the space between the tibia and the femur, not the knee-cap, which is actually higher than the joint.

Exercise:

Locating the ankle is usually easier to accomplish working in pairs, having one person standing or sitting and the other sitting on the floor in front. Place your right hand on the persons left foot so that the palm is across the expanse of the foot and the thumb is just under the top of the arch. The area just under the first knuckle of the index finger is the ankle, where the tibia meets the foot (see Figure 10. The Foot). The area under the thumb is the top of the arch, almost under the front of the ankle joint. The thumb should be fairly close to the beginning of the heel bone. If you place your other hand on the base of the heel, the student will then realize that the heel bone begins under the ankle, at the top of the arch.

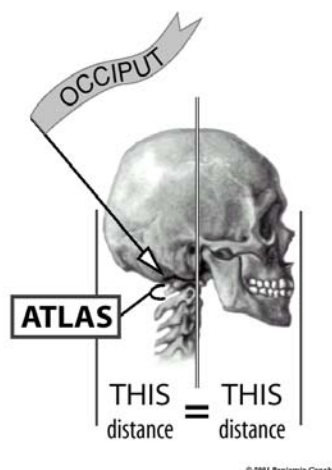


The heel bone is quite long. Through this process, students will realize that the ankle joint is not at the back of the foot, but more centrally located and there is quite a bit of distance from the front of that joint to the back of the foot.

Find Balance in Sitting and Standing

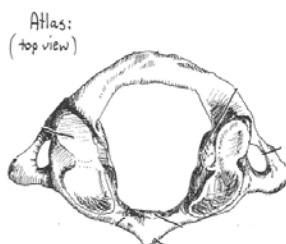
Before a clarinetist can sit or stand with balance, they must understand the unique relationship of the head to the spine, and the role the head plays in balance. The atlo-

Figure 11. Atlas and Occiput



occipital (A/O) joint (see Figure 11. Atlas and Occiput) is a gliding joint located at the top of the spine and the base of the skull. The first cervical vertebra, the atlas (see Figure 12. The Atlas), has two concave surfaces for the occipital condyles (found on the base of

Figure 12. The Atlas

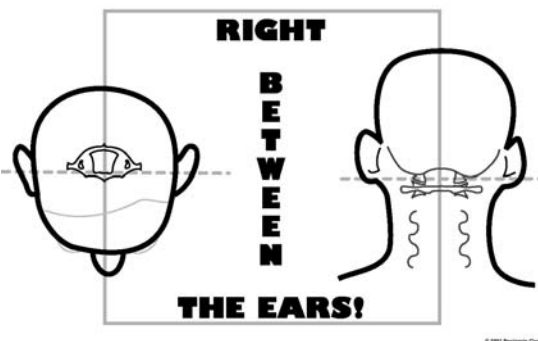


the skull) to rest in. These condyles are similar to the base of a rocking chair. The head is not held on top, it is delicately balanced at this joint. In order to experience this, students must map the location of this joint correctly. Once this is done, the muscles of the neck will no longer need to support the weight of the head and can release, allowing the head to find its place of balance on the top of the spine.

Exercise:

Ask a student to point to the place where the head meets the spine and you are likely to receive a variety of responses. If they recall that the spine is in the center of the body, it is also in the center of the neck. To locate the A/O joint, the student must place their fingers behind their earlobes just under the ear canal (see Figure 13. Location of the A/O Joint). They must then think inward and slightly up just behind the nasal cavity and into the center of the skull. Nodding the head while the fingers are in this place will help them locate the joint.

Figure 13. Location of the A/O Joint



Sitting or standing is a balancing act between gravity, joints, and weight distribution through the body. In order to achieve freedom in either activity, one must understand how weight is distributed through the body, how the center of gravity falls through the body and which joints are available to us for balancing.

The center of gravity for the body is located in the center of the pelvis, just below

the fifth lumbar vertebrae and in front of the sacral curve. This vertical center of the body passes through the A/O joint, through the front of the cervical curve and through the center of the lumbar vertebrae. The thoracic spine curves away from the center line, which allows for greater freedom of movement and is vital to clarinetists for efficient breathing (see Figure 4. The Curves of the Spine). From the lumbar spine, the weight of the body is transferred through the thick inside surface of the pelvis and into the femur heads when standing (see Figure 14. Weight through the Pelvis). Weight then travels through the femur bones, through the front of the knee joint and into the front of the ankle where it is dispersed across the arch to the heel, front toe and small toe - the tripod of the foot (see Figure 15. Weight through the Foot).

Figure 14. Weight through the Pelvis

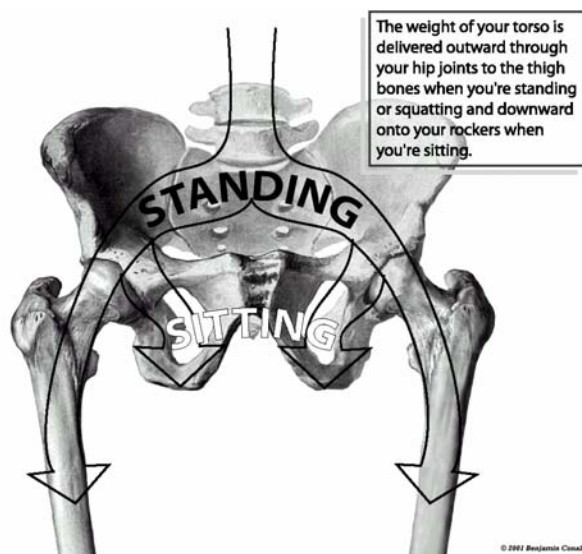
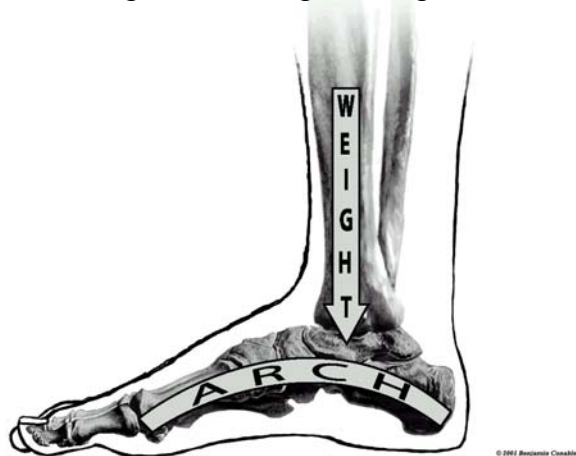


Figure 15. Weight through the Foot



Exercise:

To experience balanced standing, come into standing as before, with full awareness of the four curves of the spine. Experiment with shifting weight from the heels of the feet to the toes all the while noticing the spine, back and other joints such as your hips, knees and ankles. Notice how weight distribution affects each of these joints as well as your breathing and level of tension throughout the body. Allow your weight to come into balance, where it is equally distributed across the arch of the foot to the toes and the heel bone and each joint comes into a neutral, open position. Once you have experienced this balance, experiment with different stances with the feet to see if you can find the same quality of balance.

The same balancing applies to sitting except your sitting bones now become your feet.

Exercise:

Come into sitting and experiment with freedom in your pelvis to experience the neutral curvature of the spine. Be sure not to use the muscles of the thighs in sitting, but allow the weight of the body to pass from the base of the pelvis onto the surface of chair. This is the difference between sitting at the chair (tensing the thigh muscles and holding oneself) and sitting on the chair (releasing the hips, knees and ankles so that weight can pass from the spine into the chair through the base of the pelvis). Experiment with rocking the pelvis forward and back on the sitting bones to discover the range of flexibility as well as how you can

shift your weight forward and backward. Notice through these experiments how each “placement” affects your balance, state of tension and ability to breathe freely.

Lesson 2: Supporting the Clarinet: Body Mapping the Shoulder Girdle, Arm and Hand

Ergonomically, the clarinet is a problem. Supporting the weight of the clarinet and balancing the instrument on the right thumb is awkward and uncomfortable. Because of the design and placement of the thumb rest is not ergonomic or advantageous, it is imperative to know and understand how the structure of the hand and arm is supported by the spine and deep muscles of the torso. This will alleviate some of the discomfort associated with holding the clarinet.⁶⁴

The Shoulder Girdle and Upper Arm

Now that the student can sit or stand with balance, he or she can now consider how to hold the instrument in such a way that the instrument is supported by the spine and torso and not by the right hand alone. How a clarinetist brings their thumb to the instrument, how they think about the weight of the instrument transferring through the arm and into the body and how they organize the bones and joints of their arm and hands can make the difference between free finger movement and injury.

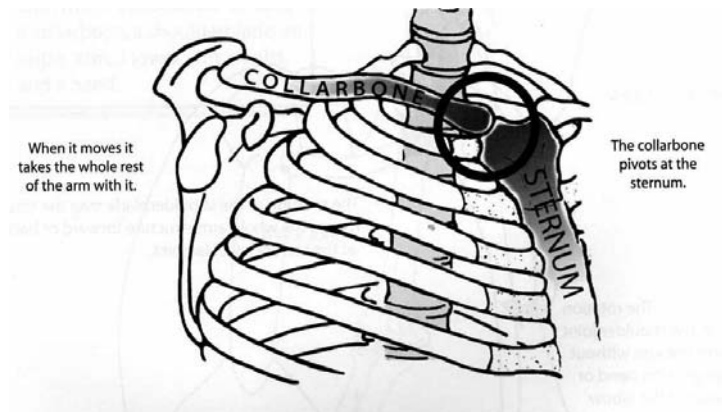
Before a clarinetist can understand how to hold the clarinet, they must understand the joints of the arm and how the arm relates to the torso. If you ask a student to tell you

⁶⁴ It should be noted that the author performs with a neck strap and encourages the use of one by his students provided that the use of it does not lead to pulling the neck down.

how many joints there are to the arm, they will likely tell you that there are three: the wrist, elbow and shoulder. If you observe their map in motion, the student will seem stiff, their breathing may be quite low in the torso (no movement of the upper ribs on the inhalation) and the movement of the arm may seem disconnected from the torso and whole body.

There are four joints to the arm structure. The joint that is often overlooked or forgotten is the sterno-clavicular joint (see Figure 16. The Sterno-Clavicular Joint).

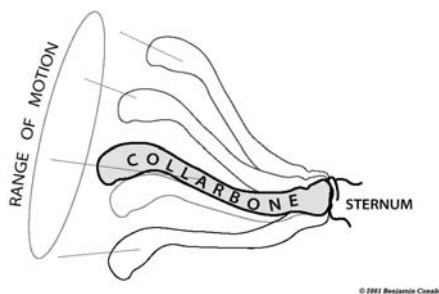
Figure 16. The Sterno-Clavicular Joint



Exercise:

To locate this joint, place your fingers on the clavicle and trace along its surface towards the center of the body. When you reach the end of that bone in the center of your body, you have found the joint of the sternum and the clavicle. Holding your hand there, begin to move the arm in all directions including reaching above the body to experience the full range of motion of the arm as well as the involvement of this joint (see Figure 17. Range of Motion).

Figure 17. Range of Motion



The clavicle in the front and the upper surface of the scapula or shoulder blade make up the structure that is referred to as the shoulder girdle (see Figure 18. Front and Back View of Shoulder). The clavicle attaches to the sternum (front view), but the scapula is suspended in connective tissue (muscle, tendons and ligaments). This suspension allows for the full range of motion of the arm and allows for the movement of the ribs underneath. In a sense, the shoulder girdle floats above the rib cavity. “It is balanced over the ribs in such a way that it centers over the weight-bearing part of the spine (see Figure 19. Shoulder over Spine).”⁶⁵ The shoulder is a light structure and is not weighted down on the torso.

⁶⁵ Conable, What musicians need to know, p. 57.

Figure 18. Front and Back View of Shoulder

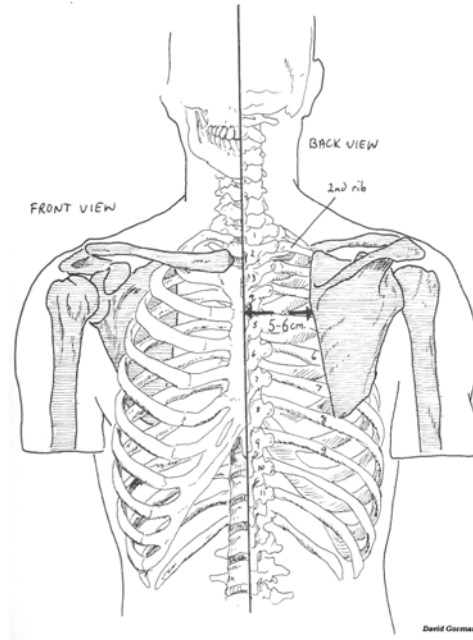
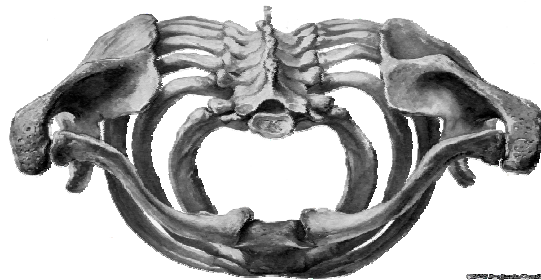


Figure 19. Shoulder over Spine



Where the clavicle and the scapula meet is commonly referred to as the shoulder joint (see Figure 20. Scapula). Looking at a skeleton or anatomical sketch, one will quickly see that the place for the joint is actually part of the scapula. This is part of the genius in the design, for the muscles that move and support the arm structure are located in the back, not the front of the body. These muscles (latissimus dorsi and trapezius) extend to the lower back and are as wide as the surface of the back on each side.

Figure 20. Scapula



The Lower Arm and Fingers

The two bones that make up the lower arm are the radius and the ulna (see Figure 21. The Lower Arm). For clarinetists, it is vital that we understand these two bones and how they allow for support and movement of the hand and wrist. If you ask a student to

Figure 21. The Lower Arm

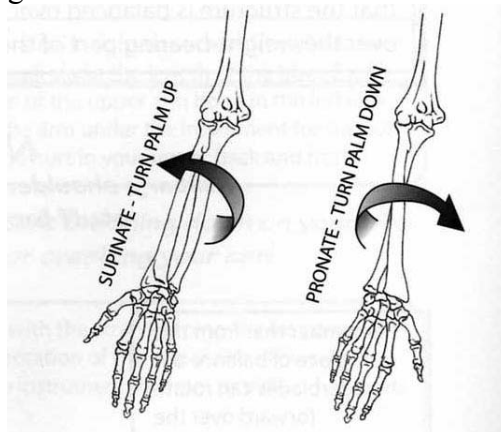


describe how the wrist rotates the hand between palm up and palm down, you are likely to get a variety of answers which will be very revealing to the student's map of their arm. The joint which rotates the hand is actually a pivot joint in the elbow area. Ask the student to allow their lower hand to rest on a flat surface and rotate the hand between

palm up and palm down, they will soon discover the location of this joint. It is important for every clarinetist to realize that this joint is in the elbow and not the wrist.

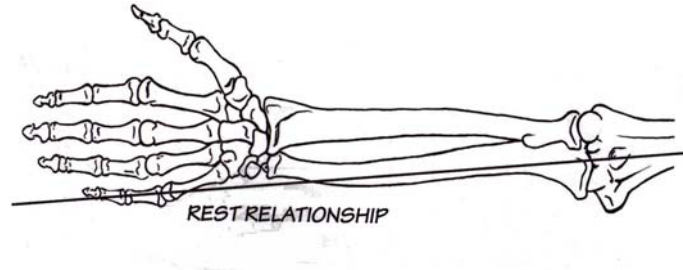
The rotation of the hand is possible through the rotation of the radius (see Figure 22. The Rotation of the Lower Arm). In the palm up position, the two bones of the lower

Figure 22. The Rotation of the Lower Arm



arm parallel to each other, but in palm down, the radius rotates and crosses over the ulna. Ask a student to experiment between rotating the hand with the little finger and the thumb, having them pay particular attention to the amount of tension in the lower and upper arm, shoulder and all the way into the lower back as they experiment. My experience is that students will feel a greater amount of tension when they lead the movement with the little finger versus the thumb. This is because the ulna (little finger side) remains stationary and is the supporting structure for the hand and lower arm. The stability of the lower arm is from the back of the elbow (the ball) through the wrist and down to the small finger (see Figure 23. The Stability of the Lower Arm). The ulna provides the axis of rotation for the hand. Knowing that wrist rotation is from the thumb

Figure 23. The Stability of the Lower Arm



side and that the joint for this rotation is all the way back in the elbow makes reaching for the right hand palette keys or the side trill keys much easier and allows the wrist to remain open and flexible. Figure 24 is an example of mis-mapping the resting relationship of the hand, wrist and lower arm. This will lead to compression in the wrist. This will lead to injury and must be avoided. Figure 25 is an example of the correct relationship.

Figure 24.
Incorrect Mapping



Figure 25.
Correct Mapping

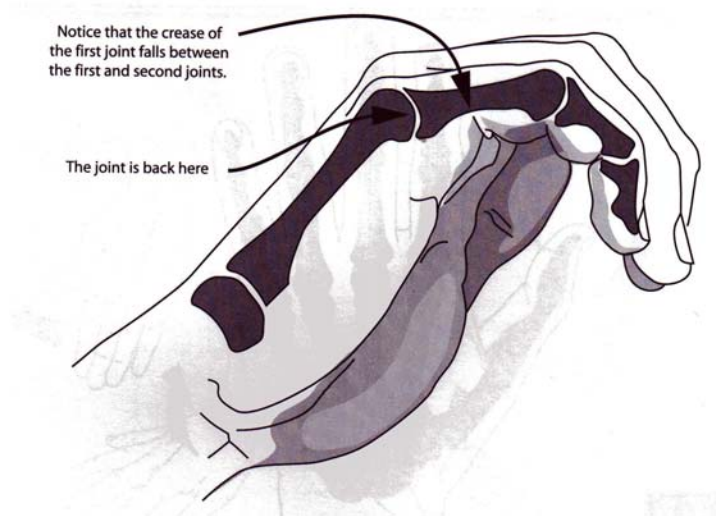


For clarinetists, a correct map of the hand is very important.

Exercise:

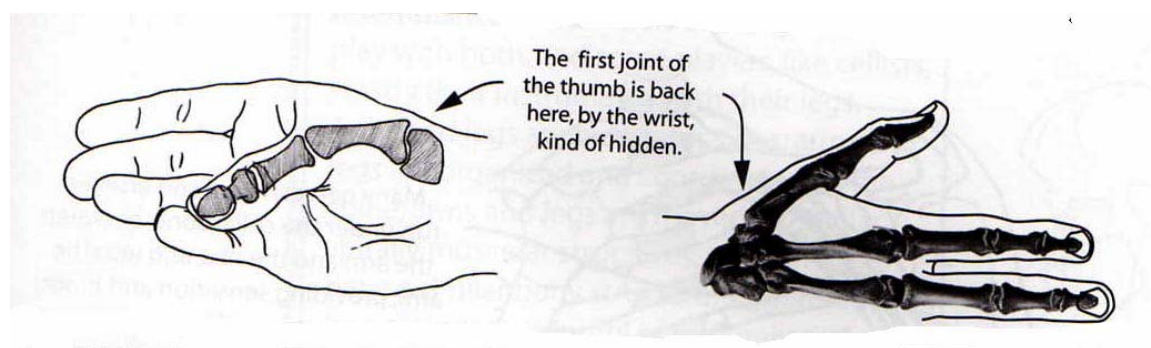
Ask a student to locate the first joint of their finger and they will likely point to the crease where their fingers meet the flesh that forms the palm of the hand. This is palm mapping and can be damaging to clarinet playing. Frequently students who palm map have misconceptions about the location and number of joints in the thumb. Clarinetists must map their hands from the outer surface in order to accurately understand the location of each joint. We move our fingers in clarinet playing from the first joint (knuckle). Heavy, tense and jerky finger motion is a clear indication that a student may not have these joints correctly mapped. To correct this map, notice the location of the knuckle on the back side of the hand and its corresponding location on the palm (see Figure 26. Joints of the Hand).

Figure 26. Joints of the Hand



Another concern of palm mapping is the joints of the thumb. Students may only think they have two joints to the thumb, but there are in fact three. For clarinetists this is vital for flexibility in the hand and supporting the clarinet. The third joint often overlooked is

Figure 27. Joints of the Thumb



at the wrist (see Figure 27. Joints of the Thumb). The thumb actually extends from the wrist. This joint gives humans our opposable thumb movement. Students who palm map may have lost some of that motion. The motion of this third joint makes it possible for clarinetists to hold the clarinet with the right thumb, and activate the thumb and speaker keys with the left thumb, and still be able to bring the other four fingers around to the front of the instrument comfortably. In my experience, I have found that once students are able to maintain open freedom in the thumb through the three joints, the interior surface of the palm becomes soft and free for the movement of each finger.

The extension of the right thumb is important for the support of the instrument. Many of the sources surveyed in this study indicate the optimal thumb rest placement to be between the back edge of the thumb nail and the closest corresponding knuckle. This placement is essential to balancing the instrument and allowing the hand to reach around

to activate the keys. If the placement is any further back, the hand will be overly tense and the fingers bunched.

Supporting the Clarinet

In my experience, students prepare to take on the weight of any item they are going to pick up or carry, be that a purse, backpack or clarinet.

Exercise:

Before they even approach the instrument, ask the student to hold the clarinet in their mind and you may see this pattern of preparation take place without the instrument. While the student is still imagining, ask them to imagine that the clarinet is as light as a feather. Continue to change the object that they are imagining, and notice the results. This can be most revealing.

Exercise:

Stand in front of a table or flat surface. Lower your body in such a way that your hands can easily rest on the surface of the table and your arms are not straight or reaching for the table. Slowly begin to shift the weight of your body into your hands, taking it off of your feet and notice the awareness this gives you of your arm structure and the supportive structures that exist throughout the back for the arms. As you continue to send weight through your arm structure, allowing the muscles of the lower back to free and the spine to come into its length (the back should feel like it is lengthening and widening). While slowly transferring the weight back into your feet, allow the back to remain free and notice the sensation throughout your hands, arms and through the chest. The arms should feel free, supported and lighter than before. Slowly, take the clarinet in your hands and bring it up to playing position (you may want to purposefully not have a reed on there to avoid playing or even thinking of playing). Notice how this new experience of your arm structure informs the manner in which you hold and support the clarinet.

Now that joints are clearly mapped, connecting the support of the clarinet back to the body is a matter of applying this new understanding of the relationship of the arm

structure to the body. The student needs to accept the weight of the clarinet, not prepare for the weight. The student then needs to connect through their joints to their spine. This is done by extending the thumb from the wrist, keeping the joints of the thumb open and not compressed. The wrist must not be held straight, but allowed to remain free and flexible as the student continues to think of the extension of the lower arm from the elbow to the small finger. By keeping the four joints (wrist, elbow, shoulder and sternoclavicular) open, the student can then connect to the deep muscles of the back through the scapula and the shoulder girdle and effectively include the entire support structure of the torso in the support of the clarinet.

Lesson 3: Body Mapping the Structures and Movement of Breathing

Finding balance in sitting or standing assists in supporting the clarinet from the spine and deep muscles of the back. This type of support frees the hands and arms for playing and also frees the torso for free and efficient breathing. In order to accomplish the demands of clarinet literature, the structures and movement of the breathing mechanism must be clearly understood and function economically and freely.

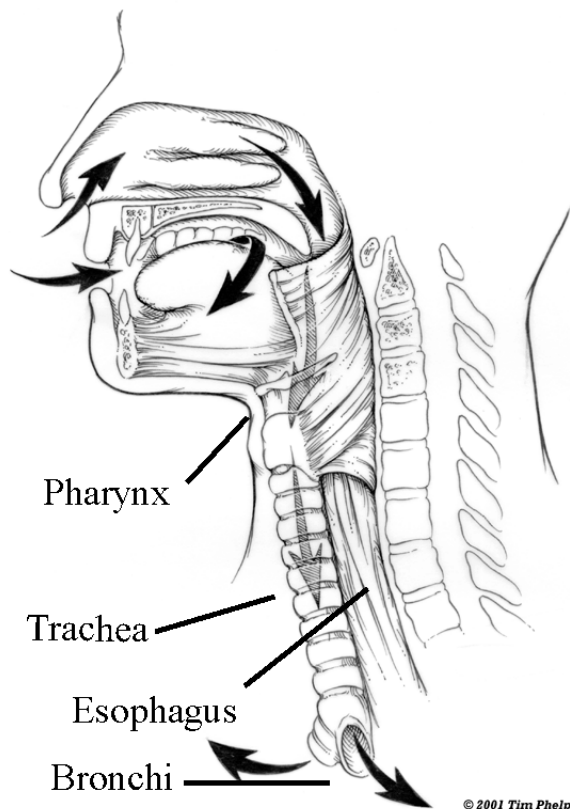
Breathing is one of the more difficult aspects of our music making process to explain. Perhaps this is due to the internal nature of breathing, i.e. you can not see air or your ribs or lungs. This is also confounded by the fact that the primary muscle for breathing, the diaphragm, cannot be felt or sensed. Frequently, students arrive looking for help with their breathing. The first comment they make is usually, "I don't know how

to breathe right” or “I can’t take a deep enough breath.” We are born knowing how to breathe. There is only one way for the breathing mechanism to function correctly and efficiently, but there are many ways that we can interfere with it.

Structures of the Upper Respiratory System

In natural breathing, air is brought into the body through the nose (see Figure 28. The Upper Respiratory System). The hairs in the nose and the many cavities of the nasal passages are responsible for filtering and warming the air for the body. Air then travels through the pharynx, or throat, and into the trachea, which is in front of the esophagus, and continues through the bronchi and into the lungs.

Figure 28. The Upper Respiratory System



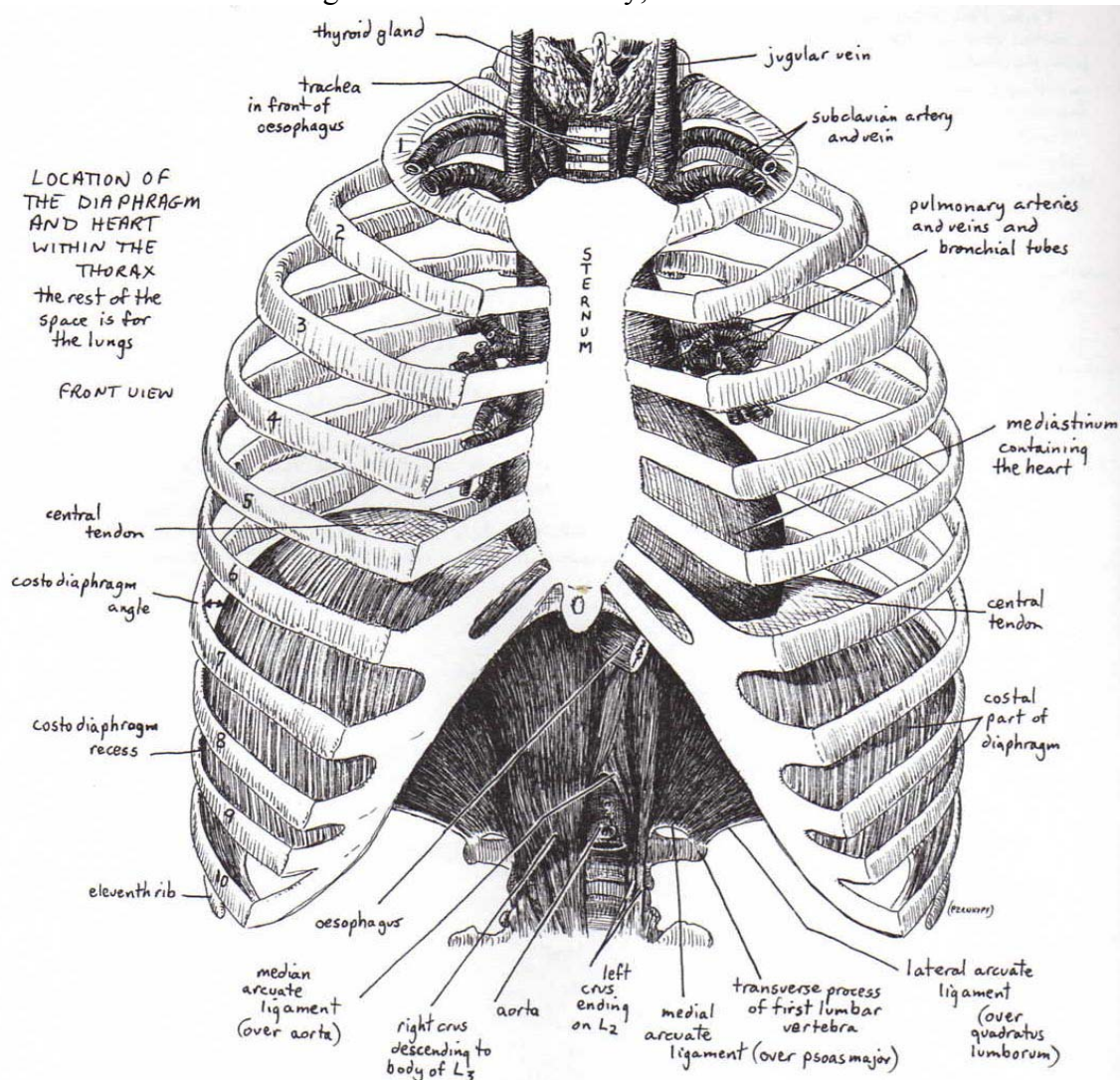
I have seen two potential mapping errors in the upper respiratory system. First, some students may not have an accurate map of the trachea and esophagus. Students who map their esophagus in front of the trachea will have excessive tension in their throat, and will very likely have an audible inhalation. Secondly, there are no muscles in the pharynx that assist in breathing, those muscles are much lower. This is important to note, as many students in an effort to bring air in to the lungs faster will tighten the muscles of the throat. This hinders air flow and creates tension in the neck and throat that can be heard in the audible inhalation.

The Structures of the Lower Respiratory System

Often there is some confusion about the location of the lungs. Such comments as “breathing low,” “getting the breath low,” “diaphragmatic breathing,” or “don’t move the shoulders with you breath” promote faulty mapping in students. Students often think that the lungs are in many places other than their actual location. The lungs are located in the upper third of the thoracic cavity⁶⁶. Figure 28 illustrates the anatomy of the rib cavity. Notice the locations of the heart, sternum and diaphragm. The area inside the ribs and above the diaphragm, this is the location of the lungs.

⁶⁶ The thoracic cavity is the upper chest or more specifically the space created by the ribs.

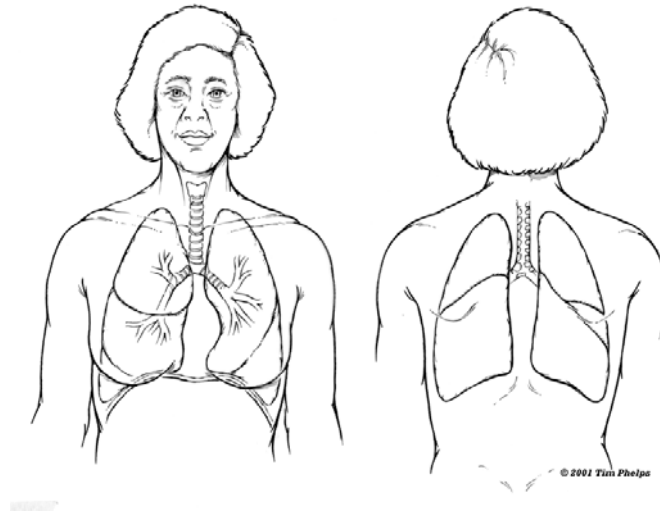
Figure 29. The Rib Cavity, Front View



Exercise:

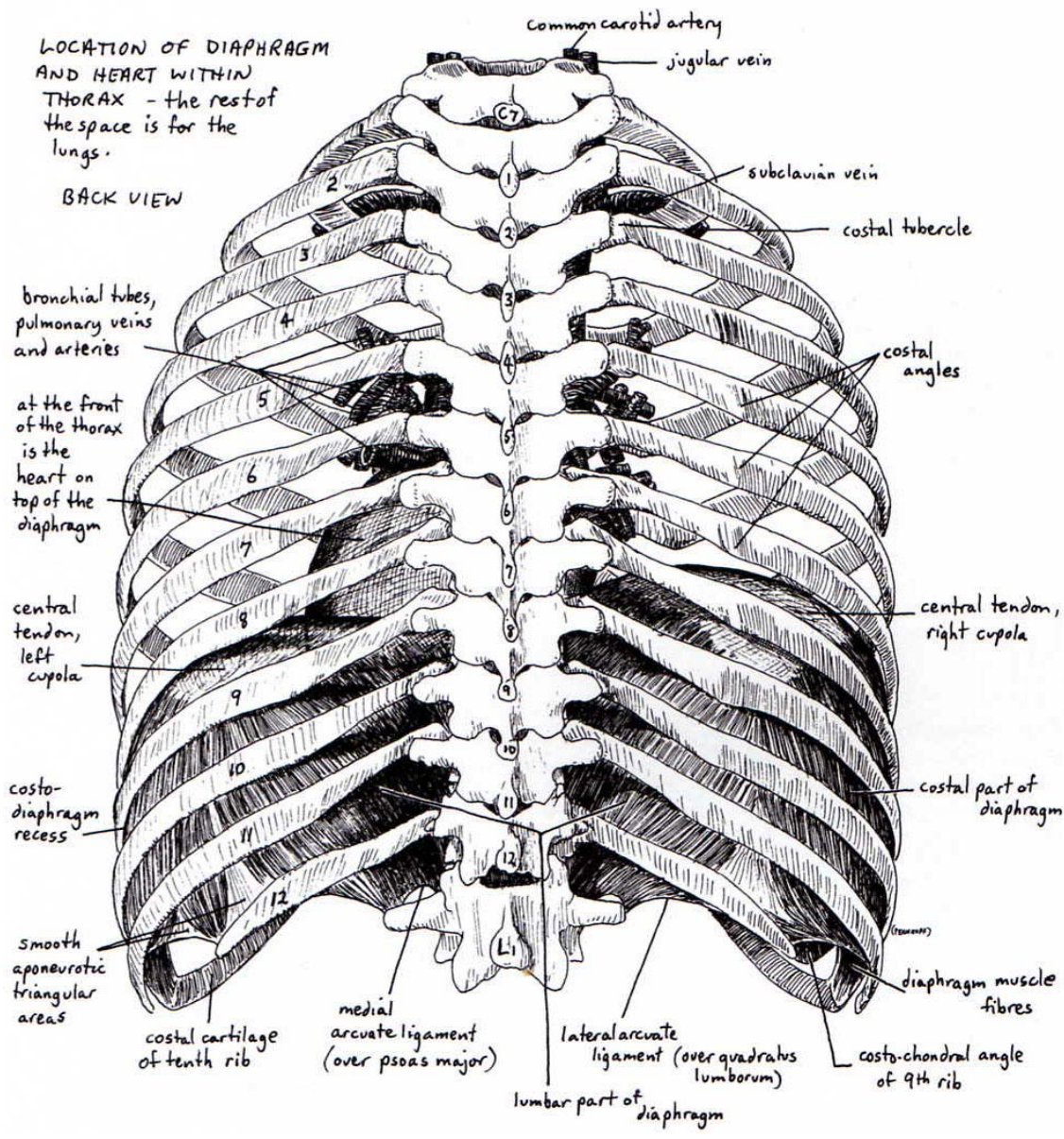
To locate the top of the lungs (see Figure 30. Location of the Lungs), place your fingers on the joint of the clavicle (collar) bone and sternum and move up from there, along the base of the neck to the dimple between the shoulder girdle at the base of the neck, this is the top of the lungs. They extend through both the front and the back of the thoracic cavity, wrapping around the spine. The lungs descend to their lowest point at the base of the tenth rib but the largest volume of lung material is from the first through sixth rib, beneath the highest point of the diaphragm.

Figure 30. Location of the Lungs



There are twenty-four ribs, twelve on each side of the body. The individual shape of each rib is important to consider in relation to the movement of the rib cavity. Figure 31 illustrates the extension of each rib out from the spine, down around and up to the front of the torso. The first ten extend around and attach to the sternum through cartilage (see Figure 29) (this cartilage allows for movement and flexibility) while the bottom two are unattached and remain floating. This multi-directional shape creates the voluminous space of the rib cavity.

Figure 31. The Rib Cavity, Back View

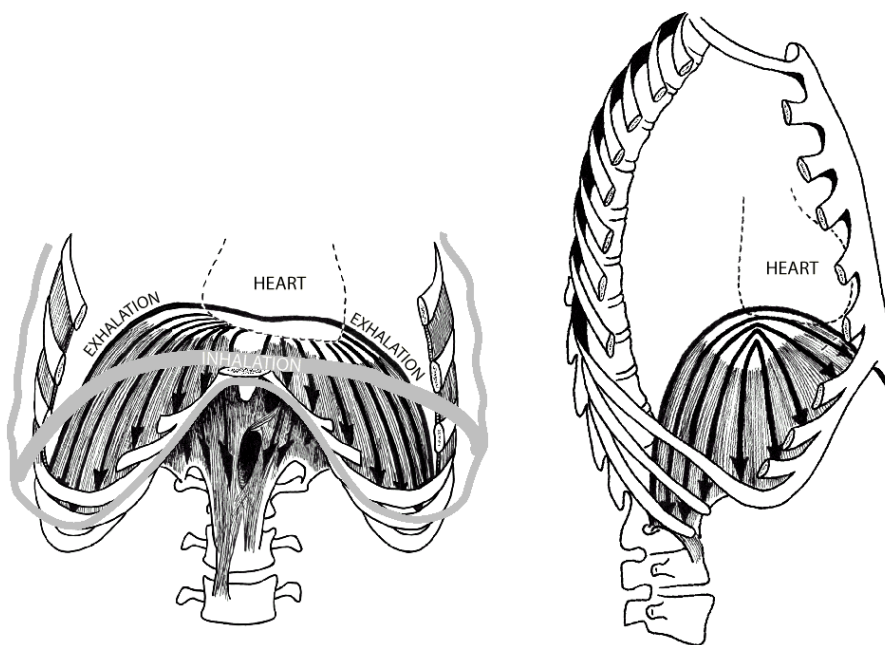


It is crucial for clarinetists not to think of their ribs as a cage. A cage is stationary and has no potential for movement. The rib cavity is very flexible and springy. Each rib has its own joint to the spine. These 24 joints are opportunities for movement, so there are in fact 24 joints for breathing.

The Movements of Breathing

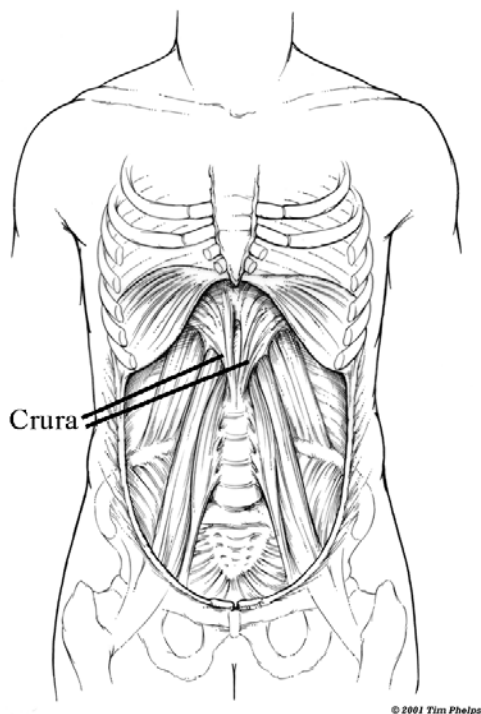
The diaphragm is the primary muscle of inhalation (see Figure 32. The Diaphragm). It attaches all along the base of the ribs in the front and back and is anchored to the 3rd and 4th lumbar vertebrae. The shape of the diaphragm allows it to dome high into the rib cavity in its resting state (exhalation), in the vicinity of the fourth rib or around the nipple line. It forms a seal between the chest cavity and the abdominal

Figure 32. The Diaphragm



cavity. No air travels below the diaphragm. The lungs and heart are above the diaphragm; the stomach, liver and other internal organs are below. During inhalation, the diaphragm contracts upon its central tendon and moves down. On exhalation, the diaphragm releases and returns to its resting place high inside the rib cavity. The legs of the diaphragm, or crura, are connected from the central tendon of the diaphragm to the

Figure 33. Diaphragm and Crura

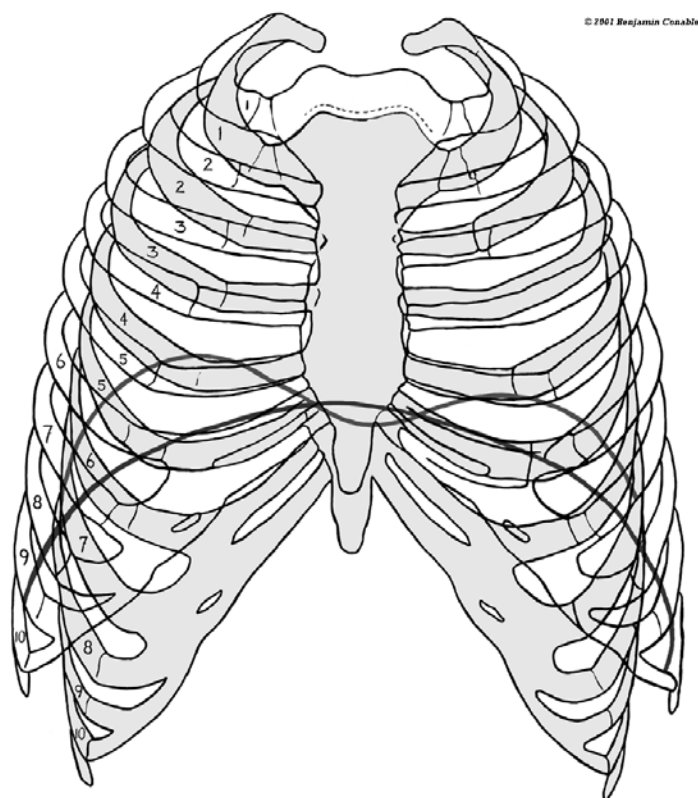


© 2001 Tim Phelps

third and fourth lumbar vertebrae (see Figure 33. Diaphragm and Crura). If a student has not accurately mapped the spinal curves, particularly the lumbar and sacral curves, and they are straightening the lumbar vertebrae, then they are directly impeding the return of the diaphragm into the chest cavity. This can have a dramatic effect on the quality of the inhalation or the quantity of air allowed into the lungs.

In inhalation, the diaphragm serves two primary functions. First, the contraction of the crura causes the highly-domed diaphragm to descend down to the area of the sixth rib, changing its shape from highly domed, to slightly less domed. This movement changes the shape of the lungs above, increasing their maximum volume. Second, the movement of the diaphragm assists in the movement of the ribs. The diaphragm attaches to the base of the rib cavity. During inhalation, the contraction of the diaphragm along its central tendon causes the diaphragm to flatten out, increasing the space at the base of the rib cavity assisting in the swinging movement of the ribs as illustrated by the non shaded segment in Figure 34 (the shaded segment shows the ribs in exhalation).

Figure 34. Movement of the Ribs

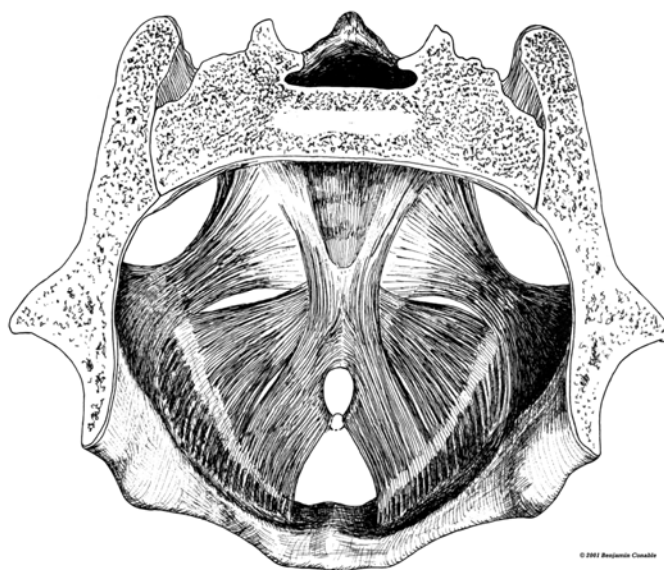


This swinging movement of the ribs, out and away from the spine changes the shape of the rib cavity, and changes the pressure inside the rib cavity, allowing air to flow into the lungs. Without rib movement, breathing capacity is severely reduced.

The downward movement of the diaphragm displaces the internal organs beneath the diaphragm (stomach, liver, colon etc.). The movement of the internal organs is seen visually when we inhale in a lying down position and is often confused as the movement of the diaphragm. Students must realize that the diaphragm is still quite high in the thoracic cavity and does not ever extend below the tenth rib. These organs move down and away from the spine in all directions, placing pressure on the entire abdominal wall, not just the muscles of the front. It is important for clarinetists to realize this movement is in all directions, and recognize that the abdominal cavity is a cylinder, not just a group of muscles under the ribs. Pressure should be experienced equally, on all sides of the abdominal wall, not just the front abdominal muscles.

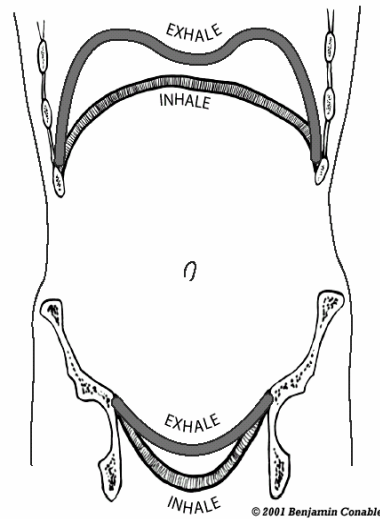
The movement of the internal organs also places pressure on the muscles of the pelvic floor. The pelvic floor is a web of muscles (see Figure 35. Pelvic Floor) that assist

Figure 35. Pelvic Floor



in many bodily functions such as waste removal, and child birth. They also provide support for the internal organs which is essential for breathing. If the pelvic floor relaxes on the inhalation, the downward movement of the internal organs will cause the pelvic floor to descend as well, in concert with the diaphragm (see Figure 36. Coordinated Movement). This movement is necessary for allowing the maximum displacement for the internal organs, maximizing breath capacity of the lungs: the freer the abdominal cavity, the more organ movement, which allows for more movement of the diaphragm, granting more movement in the ribs and more expansion of the lungs. This internal movement is necessary for digestion, and necessary for clarinetists to experience the full capacity available for each breath.

Figure 36. Coordinated Movement



The movements of inhalation create a great deal of internal displacement and pressure inside the thoracic cavity. The lungs are full of air, the ribs are in their upward and expanded position, and the internal organs are displaced, placing pressure on the pelvic floor and abdominal cavity. The movement of exhalation is the exact reversal of that process, the release of pressure. The diaphragm releases, moving back up into the rib cavity. The internal organs travel back to their resting place. The muscles of the pelvic floor and abdominal cavity rebound back to their resting state and the ribs swing in and down to their resting position as the air leaves the lungs. These are the movements of natural exhalation.

Breath Support and Control

For clarinetists, it is vitally important to understand which movements of exhalation contribute to both control and support for the breath. During inhalation, the ribs move from each joint, out, up and away from the spine, creating the space for the lungs to fill with air. The lungs are not muscle tissue, they do not move on their own. This movement is assisted in part by the diaphragm. The intercostals muscles also aid in this movement. The intercostals muscles are located between each rib. There are two sets, grouped in pairs between each rib. One set functions in inhalation, moving the ribs up. The second set functions in exhalation, moving the ribs back down to their resting state. The downward movement of the ribs expels the air from the lungs, creating our breath control. By controlling the rate at which our ribs descend, we can create the air speed necessary for tone production.

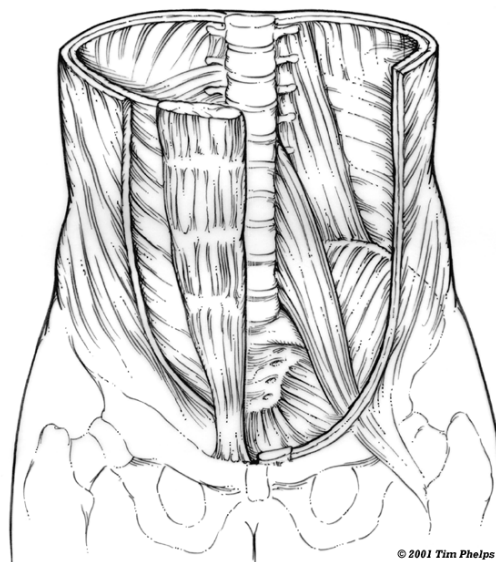
The diaphragm is an inhale-only muscle; its only action during inhalation is to be drawn down in the chest cavity to the level of the tenth rib by the contraction of the crura. This movement assists in the expansion of the lungs above and the movement of the ribs. On exhalation, the diaphragm releases and moves back to its resting place, highly domed in the rib cavity. We cannot control the release of or engage the diaphragm to push up against the lungs. Students who think that they can push or support from the diaphragm will often have excessively tense abdominal muscles, impeding on the movement of the internal organs which adversely affects their overall capacity for inhalation.

The displacement of the abdominal cavity from inhalation is the primary means for support on exhalation. The abdominal cavity is a vacuum. It is sealed by the

diaphragm, abdominal wall and pelvic floor. No air can travel into the abdominal cavity. Because of this, we may change the overall shape of the abdominal cavity, but not its volume. During inhalation, the displacement of the internal organs changes the shape of the abdominal cavity. This is done primarily with the movement of the diaphragm. On exhalation, we can interfere with the movement of the diaphragm back up into the rib cavity by controlling the return of the internal organs to their natural resting place. This is done with the whole abdominal wall and the rebound of the pelvic floor. It is important for clarinetists to recognize that the abdominal cavity expands in all directions, not just the front see (Figure 37. The Abdominal Cavity).

Clarinetists should consider the spine as a support structure for breathing. The nose, nasal cavity, and trachea lie along the cervical spine. The ribs, lungs and diaphragm lie along the thoracic spine. And the internal organs, abdominal wall and

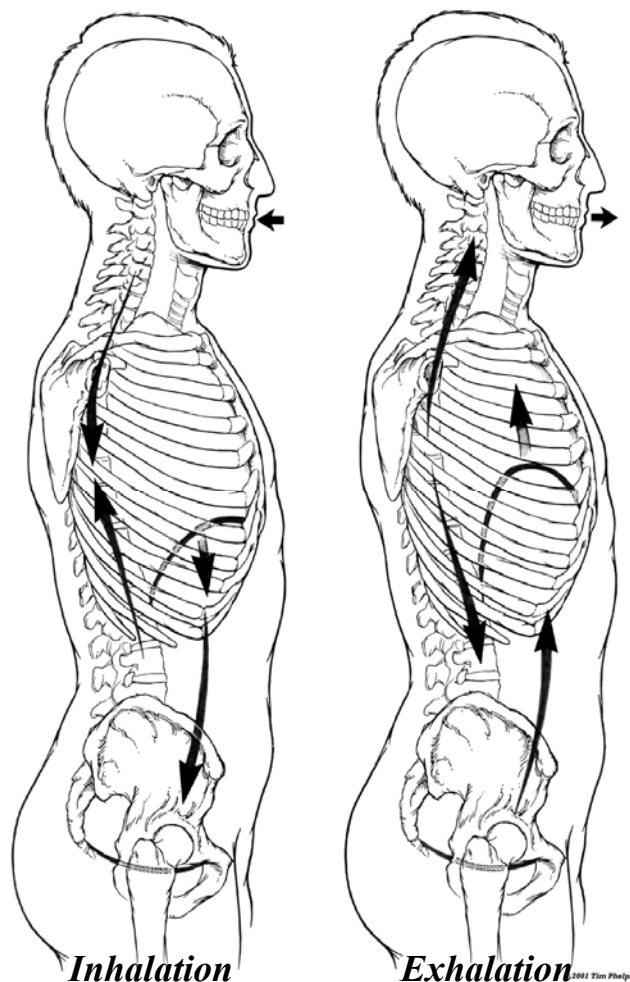
Figure 37. The Abdominal Cavity



pelvic floor lie along the lumbar spine, sacrum and pelvis. The crura of the diaphragm are attached to the front of the lumbar spine. Therefore breathing is a spinal activity.

The movement of the spine (see Figure 38. Movement of the Spine) also assists in the breathing mechanism. The spine is flexible and dynamic. On inhalation, as the ribs swing up, out and away from the spine, the thoracic curve actually deepens and the spine gathers. It does not shorten, but simply travels within its range of motion as the curves deepen with the expanding rib cavity. On the exhalation, the spine lengthens as

Figure 38. Movement of the Spine



the curves become less deep, and the ribs travel down and in to their resting state. This deepening and lengthening of the spine in relation to breathing is natural. This is not something that we must facilitate, however we can interfere with it. This is why it is essential for teachers, when discussing the posture and carriage of the body, to use language that encourages freedom and poise in the body and balance in all joints.

Common Mapping Errors of Breathing

Some teachers ask the student to “breathe low” in order to prevent shallow breathing, and to engage the support mechanism. This comment can be very confusing to students. The problem with this statement is two fold: first, no air goes below the diaphragm. Any metaphors we create for “breathing low” are false and confusing. Second, it overlooks the importance of the upper chest in breathing. The lungs lie in the upper third of the chest, underneath the ribs. If a clarinetist is not allowing for adequate rib movement, then they are not creating the conditions necessary to use the full capacity of their lungs. Clarinetists must free the abdominal wall and pelvic floor to allow for the maximum expansion and support for the breath on the inhalation and engage the support of the abdominal cavity in the exhalation. They should breathe both “high and low.”

Occasionally I have seen exercises in breathing, designed to “engage” support. One such exercise involves the placement of a fist in the front abdominal muscles, just below the ribs. In this exercise, students are instructed to push out against the fist with the front abdominal muscles as they exhale in order to have the proper support to play their instruments. Not only is this movement opposite to the flow of the breathing

mechanism, it is uncomfortable and defeats the intended purpose of the exercise, to engage support for the breath. The exercise deliberately impedes that natural movement of the internal organs, thereby inhibiting the returning of the diaphragm to its highly domed resting state in the rib cavity. Because the abdominal cavity is a vacuum, you are not allowing for the maximum exhalation, which subsequently affects the quality of your next inhalation.

Some teachers advise against moving the shoulders on the inhalation. There is some truth in this statement. Intentionally lifting the shoulder girdle on inhalation is an unnecessary movement and will result in excessive tension in the upper body. However, in an effort to not move the shoulders, many students will hold their shoulders still, creating excessive and unneeded tension in the upper chest, thereby inhibiting breath capacity.

The shoulder joint is formed in the front by the clavicle and in the back by the upper ridge and outside edge of the scapula or shoulder blade. The only connection between the arm and torso is through the joints of the clavicle and the sternum. The scapulae float in the connective tissue and muscles of the back, they are not attached or jointed to the back. This allows for a great deal of flexibility. The scapulae are also thin, curved and very light weight, thereby reducing the overall weight of the shoulder girdle. In a sense the shoulder girdle floats over the rib cavity, in a state of muscular suspension, allowing maximum movement and flexibility of the mechanism and what is underneath.

Exercise:

I find it important to remind students that the lungs lay underneath the first rib at the base of the neck. Realizing that your lungs are directly underneath the first rib, it becomes apparent that there is lung material up and all around the shoulder girdle. On inhalation, if we allow for maximum movement in the upper ribs, and maximum expansion of the lungs, there will be movement in the shoulder girdle. As the upper ribs swing and the lungs expand and fill with air, the floating shoulder girdle will ride this movement along with the expansion in the back and movement of the shoulder blades. It's better to tell our students to not intentionally move the shoulders, but to allow for the natural movement from the expansion of the ribs underneath.

Phrases like “breathe low,” “don’t move your shoulders,” “support from the diaphragm” and “stand or sit up straight” are just a few of the common phrases in the teaching of the clarinet that can be confusing to students. Often when clarinetists hear these phrases, they set off to come in contact with their diaphragms, breathe from their stomachs, hold their chests and shoulders still and adopt a postural stance that is tense and rigid. This affects all aspects of their playing including technical development and sound production. They end up with a great deal of excessive tension, pain and often play in a state of confusion. Through Body Mapping, we can correct the faulty maps that students develop as a result of these phrases by using language that is based on fact, not myth and falsehoods.

The body is a complex, coordinated mechanism. Each movement happens together, not in isolation. A clarinetist cannot support the instrument with the body unless he/she understands how to use the spine for support and the joints for balance. Once balance is achieved, the instrument becomes an extension of the body, not an apparatus that is held or gripped. Through balance, the body is freed so that the breathing

mechanism can function at its most effective and efficient level and become a whole body experience.

CHAPTER IV

CONCLUSIONS

Conclusions

The purpose of this research was to adapt existing information on Body Mapping to clarinet teaching and performance. This study was guided by the following research questions:

1. How can Body Mapping be used as an effective teaching tool in the clarinet studio?
2. What are common errors of the body map that affect clarinetists?
3. What common mapping errors exist in the literature of clarinet pedagogy?

Through a thorough survey of literature in clarinet pedagogy it was determined that very little had been said or understood about the use of the body in clarinet playing. Although the body is half the instrument and affects all aspects of playing, in this study I chose to focus on three essential components of clarinet playing - posture, support of the instrument and breathing. The literature surveyed offered little discussion on the use of the body and support of the clarinet. However, most authors agreed that breathing was a central consideration to good clarinet playing and discussed this topic in great detail. In their discussions on breathing, I found that many authors presented inaccurate anatomical and physiological information.

Two sources briefly mentioned posture. Willaman and Weston both indicated that leaning forward will assist with breathing. As described in chapter four, to maximize efficient use of the whole body in breathing, it is important to balance on the ischial

tuberosities in the sitting position. Leaning forward brings the center of gravity forward in the body, taking the torso off of its core support, thus engaging the muscles of the abdominal wall. This in turn forces these muscles to support the torso which interferes with breathing.

To support the instrument, Stubbins and Stein both advocated the placement of the thumb rest on the right thumb, between the back edge of the nail and the closest joint. Many authors described the specific placement and shape of each finger and discussed the importance of finger movement from the back joint of each finger agreeing that this was essential to good technique. Of the authors who mentioned anything concerning the use of the hands or arms in playing, at no time were anatomical drawings included or a process given for locating the joints mentioned. Stubbins did provide photos of his hands playing the instrument to demonstrate not only finger placement, but freedom in the hands. In the literature reviewed, there has been no discussion on supporting the clarinet from the body or how to accomplish this.

A full description of breathing was discussed at length by all authors surveyed except Gold. Stubbins presents the most accurate description of the anatomical structures and the process of respiration, but does not include pictures to assist his explanation. Willaman and Brymer mention that the natural breathing process should be adhered to while playing the clarinet. They do not describe this process, but simply state that a student should not interfere with this natural process.

Stein, Pino and Pay both used extensive metaphor to describe what breathing should “feel” like, but didn’t provide adequate anatomical information to support the

metaphors. Therefore it is difficult to understand their meaning and much is left open to interpretation. Pay, Thurston, Tosé, Russianoff, and Ridenour describe the diaphragm and its role in breathing. They make false statements regarding the function of the diaphragm in exhalation and give inaccurate locations for the diaphragm in both inhalation and exhalation. Weston and Stein both suggest that the shoulders should not move. As described in chapter four, restricting the movement of the shoulders interferes with a full inhalation and creates tension throughout the shoulder area, neck and embouchure. Stein, Weston, Russianoff and Ridenour describe conceptual processes each based on inaccurate information. Stein recommends only filling the lower area of the lungs. Weston advocates leaving the ribs in their upward, inhaled position through the extent of the exhale. Russianoff suggests pushing the abdominal cavity down and out before the inhale. Ridenour's complex compression method requires an expansion of the abdomen throughout the exhalation in order to create support. All of these conceptual ideas of breathing are based on misconceptions of the diaphragm and our ability to control it. In each case, the suggestions will actually impede the natural breathing process and creates a great deal of excessive tension throughout the body.

These mapping errors and many others prevalent in clarinet playing have been discussed in chapter four of this document. My research has included Body Mapping sources and my own discoveries and observations as a teacher of clarinet and Alexander Technique. I have found the use of this material easy to include in the space of a clarinet lesson and very useful in helping to create awareness in the students of efficient and effective clarinet technique. With each student I teach, my approach varies. Some

students require a great deal of detail and description while others only need a simple clue or small piece of information. In either situation, as a body of knowledge, Body Mapping can be an invaluable resource for any teacher of clarinet. Through the understanding of anatomy, a teacher can carefully choose words that accurately and clearly describe both the structures and the processes of the body. This understanding will lead to a heightened physical awareness in the student's performance and a more coordinated and effective use of the student's personal instrument – his or her body – in playing the clarinet.

While this information may seem obvious and simple, the crucial “ah-ha” moment of realizing and identifying with the body, which Body Mapping creates, is profound when it occurs. To understand Body Mapping intellectually is only part of it. To experience it on a physical level is a revolution that makes a lasting impression. While discussing Body Mapping can be beneficial, the full effects are felt when it is applied through direct experience. In order to fully benefit from this information, you must take the time to work through each section thoroughly, taking personal notes, discovering the faulty map, and moving to experience the change throughout the whole body – the corrected map.

Suggestions for Further Research

A document such as this is valuable and should be prepared for each instrument as a pedagogical tool for teaching. As with clarinet pedagogy, I am confident that the same mapping errors exist in all pedagogical literature. This should be addressed and included

in pedagogical training and education. A second area of investigation might be the application of Body Mapping in early childhood programs such as day-care or primary education. This might be useful in preventing common mapping errors found in adulthood. Additionally, since Body Mapping is a supportive study of the Alexander Technique, an investigation should be done on the effects of including Alexander Technique in the core curriculum of musical students in higher education.

BIBLIOGRAPHY

Dissertations

- Fedele, Andrea Lynn. *The Alexander Technique: A Basis for Oboe Performance and Teaching*. D.M.A. diss. University of Illinois at Urbana-Champaign, 2003.
- Holm, Carolyn Postma. *Correctives to Breathing Hindrances in Flute Performance, with Emphasis on the Alexander Technique*. D.M.A. diss. The Southern Baptist Theological Seminary, 1997.
- Kaplan, Iris. *The Experience of Pianists who have Studied the Alexander Technique: Six Cases Studies*. Ph.D. diss. New York University, 1994.
- Knaub, Meribeth Jill. *Body Mapping: An Instructional Strategy for Teaching the Alexander Technique to Music Students*. Ph.D. diss. University of Pittsburgh, 1999.
- McCulloch, Carol Porter. *The Alexander Technique and the Pedagogy of Paul Rolland*. D.M.A. diss. Arizona State University, 1996.

Books

- Alcantara, Pedro de. *The Alexander Technique: A Skill for Life*. Crowood Press: Great Britain, 1999.
- _____. *Indirect Procedures*. Clarendon Press: England, 1997.
- Alexander, F.M. *The Use of the Self*. Orion Books: Great Britain, reprinted 1985.
- _____. *Man's Supreme Inheritance*. Mouritz Press: Great Britain, 2003.
- _____. *Constructive Conscious Control of the Individual*. Mouritz Press: Great Britain, 2004.
- _____. *The Universal Constant of Living*. Mouritz Press: Great Britain, 2000.
- Bloch, Michael. *F.M. Alexander: The Life of Frederick Matthias Alexander, Founder of the Alexander Technique*. Clays Ltd.: Great Britain, 2004.

- Brymer, Jack. *Clarinet*. Kahn & Averill: London, 1990.
- Conable, Barbara and William Conable. *How to Learn the Alexander Technique: A Manual for Students*. Andover Press: Ohio, 1995.
- Conable, Barbara. *What Every Musician Needs to Know about the Body: The Practical Application of Body Mapping to Making Music*. Andover Press: Oregon, 2000.
- _____. *The Structures and Movement of Breathing: A Primer for Choirs and Choruses*. GIA Publications: Chicago, 2000.
- _____. ed. *Marjorie Barstow: Her Teaching and Training*. Andover Road Press: Columbus, 1989.
- Dunbar, Rudolph. *Treatise on the Clarinet*. Dallas & Sons, Ltd: England, 1939.
- Gelb, Michael. *Body Learning*. Henry Holt and Company: New York, 1994.
- Gilmore, Robin. *What Every Dancer Needs to Know About the Body*. Andover Press: Oregon, 2005.
- Gold, Cecil, ed. *Clarinet Performing Practices and Teaching in the United States and Canada*. University of Idaho: Idaho, 1973.
- Gorman, David. *The Body Moveable*, 5th edition, LearningMethods Publications: Canada M8Y 3M7, 2002
- Jones, Frank Pierce. *Freedom to Change: The Development and Science of the Alexander Technique*. Mouritz Ltd: London, 1976.
- Lawson, Colin, ed. *The Cambridge Companion to the Clarinet*. Cambridge University Press: Cambridge, 1995.
- Maisel, Edward, ed. *The Alexander Technique: The Essential Writings of F. Matthias Alexander*. Carol Publishing Group: New York, 1989.
- Mark, Thomas. *What Every Pianist Needs to Know About the Body*. GIA Publications: Chicago, 2004.
- Mazzeo, Rosario. *The Clarinet: Excellence and Artistry*. Alfred Publishing: USA, 1981.
- Norris, Richard. *The Musician's Survival Manual: A Guide to Preventing and Treating Injuries in Instrumentalists*. International Conference of Symphony and Opera Musicians: Texas, 1993.

- Pearson, Lea. *Body Mapping for Flutists: What Every Flute Teacher Needs to Know About the Body*. Flutibia: Ohio, 2002.
- Pino, David. *The Clarinet and Clarinet Playing*. Scribner's Sons: New York, 1983.
- Ridenour, Thomas. *The Educator's Guide to the Clarinet: A Complete Guide to Teaching and Learning the Clarinet*. Published by the author: Texas, 2000.
- Russianoff, Leon. *Clarinet Method, Bk. 1*. Schirmer Books: New York, 1982.
- Stein, Keith. *The Art of Clarinet Playing*. Summy-Birchard Company: Illinois, 1958.
- Stubbins, William H.. *The Art of Clarinetistry*. Ann Arbor Publications: Michigan, 1965.
- Thurston, Frederick. *Clarinet Technique*. Oxford University Press: London, 1977.
- Tosé, Gabriel. *Artistic Clarinet: Technique and Study*. Highland Music Company: California, 1962.
- Weston, Pamela. *The Clarinetist's Companion*. The Chaucer Press: Great Britain, 1976.
- Willaman, Robert. *The Clarinet and Clarinet Playing*. Carl Fischer: New York, 1954.

Articles

- "Marjorie Barstow in Australia: The Workshops." *Direction: A Journal on the Alexander Technique* 1, no 2 (1987).
- Brenner, William, "Practical Marj," *Direction: A Journal on the Alexander Technique* 1, no. 2 (1987) reprinted on <http://www.ati-net.com/articles/dm-bill.php> (accessed March 26, 2007).
- Conable, Barbara. "Body Mapping." <http://www.bodymap.org/bodymapping.html> (accessed February 12, 2007).
- Dennis, Ron. "Good Use in Instrumental Performance: The Alexander Technique." *The Clarinet* 6, no. 3 (1979) p 26.

Frick, Brigette. "Swiss Kaleidoscope." *The Clarinet* 12, no. 3 (1985): 44.

Jones, Carol Anne, Richard Norris, Judy Palac, Robert T. Sataloff, Victor Sazer, Darin Workman, Alice Brandfonbrener. "Music and Medicine: Preventing Performance Injuries." *Teaching Music*, 9, issue 2. October 1, 2001.

Nichols, Richard "Scientific Basis of Body Mapping,"
<http://www.bodymap.org/articles/artscientificbasis.html> (accessed February 12, 2007).

Pino, David. "The Clarinet Teaching of Keith Stein, Part One: The Relation of Posture and Balance to Clarinet Playing." *The Clarinet* 29, no. 4 (2002): pp 70-72.

Workshops

Conable, Barbara. "What Every Musician Needs to Know About the Body." Weekend course in Portland, Oregon. May 2005.