

THE BREATH OF MUSIC

by

Christopher Cody Barrier

A Thesis

presented in partial fulfillment
of the requirements for the degree of
Master of Science
in the Department of Music
University of Central Missouri

April, 2009

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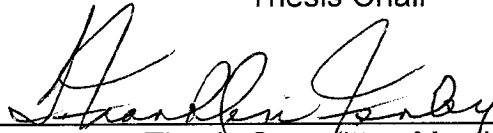
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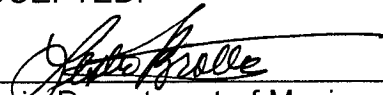


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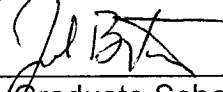


Thesis Committee Member

ACCEPTED:



Chair, Department of Music



Dean, Graduate School

UNIVERSITY OF CENTRAL MISSOURI
WARRENSBURG, MISSOURI

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An Abstract

of a thesis submitted in partial fulfillment
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ABSTRACT

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One of the most basic and fundamental things one does to sustain life is breathe. This is done everyday without any thought. Breathing is also one of the most fundamental things done to create sound. Almost all forms of sound require air. Musicians must have a good understanding of how breathing works and how to control their breathing in order to properly and efficiently create sound. Too often musicians forget the importance of proper breath support and do not teach it to their students or incorporate it into their playing. This thesis will provide an understanding of the mechanics of breathing, proper posture, and tools to help measure breathing, as well as breathing exercises that can be incorporated in a classroom setting. Once musicians have control of their breathing, they will be able to move past the notes on the page easier and begin to breathe life into music.

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CHAPTER 1
WHY BREATHING IS IMPORTANT

One of the most basic and fundamental things one does to sustain life is breathe. This is done everyday without any thought. Breathing is also one of the most fundamental things done to create sound. Almost all forms of sound require air. Only string, keyboard, and percussion performers do not need air to make music. Singers use air to activate their vocal chords; brass players must use their air to activate the embouchure; woodwind players must use air to activate their reeds; and flutists must blow air across the tone hole to produce sound. Musicians must have a good understanding of how breathing works and how to control their breathing in order to properly and efficiently create sound. "What students need most of all is a clear understanding of the breathing processes, and a knowledge of their management for artistic purposes."¹ This thesis will provide an understanding of the mechanics of breathing, proper posture, and tools to help measure breathing, as well as breathing exercises that can be incorporated in a classroom setting.

1. Harry C. Thorpe, "Breathing and Common-Sense," *The Musical Quarterly* 9, no. 1 (Jan. 1923), 56.

“Too often a well-meaning instructor, through verbose descriptions, will complicate the student’s natural breathing process and inhibit, rather than aid, the students’ progress.”² It is very important to have an understanding of breathing and how it works. One does not want to teach improper breathing to students. “Poor or wrong breathing is the most common and dangerous element for the young students to overcome.”³ It is difficult enough, as a beginning musician, to learn how to play an instrument or sing correctly and read music at the same time. Teachers need to make sure that improper breathing is not holding the student back. “Proper breath control is the foundation upon which the performer of a wind instrument must depend.”⁴ The stronger the foundation a student has to stand on, the better and quicker the progress the student will make. This is why it is extremely important that proper breathing be taught to beginning band and vocal students and continually taught throughout middle school and high school.

Even if a student has been taught how to breath correctly, the breathing process must be constantly refreshed and evaluated. Students will often stop paying attention to how they are breathing and revert to everyday breathing used to sustain life. “ We must realize that in playing any respiratory organs normally

2. Harvey Phillips and William Winkle, *The Art of Tuba and Euphonium* (Secaucus, New Jersey: Summy-Birchard, 1992), 21.

3. Joseph A. Trongone, “Breath Control for Horn Players” *Music Educators Journal* 34, no. 4 (Feb. - Mar. 1948): 40.

4. Trongone, 40.

perform.”⁵ The breath taken on a day-to-day basis is usually very shallow and unsupported. “In essence, this means bringing the breathing process out of the darkness of our unconscious and becoming aware of it and its uses through conscious thought.”⁶ Only then will the student begin to use proper breath support or management when playing or singing. Learning how to take a proper breath and using good support is only half of the battle when it comes to breathing. Students must also be aware of their posture when playing or singing.

Breathing, more than any other aspect of playing, benefits or suffers as a direct result of posture. “Good posture is easy to achieve; the only hard part is remembering to do it.”⁷ Students will often stop paying attention to how they are sitting and start to slouch or lean to one side or the other. This creates unnecessary tension in the body that disrupts the flow of air. When playing or singing the performer should be in a position that is comfortable and allows them to perform in a relaxed manner. Only with a tension-free, relaxed body will the air be able to flow freely from the lungs into the instrument. After the student starts to use correct posture and proper breathing, the teacher must find ways to expand and develop better breathing.

5. Larry Teal, “Some Fundamentals for the Saxophone,” *Music Educators Journal*, 25, no. 2 (Oct., 1938): 50.

6. Delbert A. Dale, *Trumpet Technique* (New York: Oxford University Press, 1965), 30.

7. Keith Johnson, *Brass Performance and Pedagogy* (Upper Saddle River, New Jersey: Pearson Education, 2002), 27.

The amount of air students inhale when first being taught how to breath properly is not going to be his/her full capacity. This can only be achieved by the use of different tools, exercises and techniques. There are many different books published that have different breathing techniques in them. The *Breathing Gym* is a book just about proper breathing techniques. Few books are dedicated solely to breathing, but that does not mean that they do not have good ideas or techniques in them. There are many exercises and techniques that a teacher may use to improve breathing, as well as many low-cost tools that measure breathing.

Some tools will measure how much air a person inhales while others will measure how much and how fast a person is breathing. These tools may be incorporated very easily into a classroom setting. They allow the students to see tangible evidence of their breathing. A teacher may talk about breathing all day, but it can be a hard subject for students to grasp because it is not something that can be seen. "The fact that we have all breathed naturally all our lives does not mean that instrumental breathing is something that will come easily to every player."⁸ Consequently, the tools that measure breathing are very important. They not only show how much air a student is breathing, but they can also be used to keep track of the improvements students make.

8. John R. Griffiths, *The Low Brass Guide* (Hackensack, New Jersey: Jerona Music Corporation, 1980), 1.

If students can see and track their progress, they will be more inclined to work harder, and the teacher can turn their progress into a friendly competition of who can improve the most and who can breath the deepest. When students have motivation to learn, it makes teaching the concept of proper breathing and support much easier.

When it comes to teaching breathing, the teacher must remember that proper breathing is not something that all students will understand immediately. They have been breathing since they were born, and old habits die slowly. The importance of teaching breathing is not to correct what is wrong, but to establish what should be right. "Teaching breathing can be very tricky, so when teaching you should always try for the simple answers that bring about proper motor response."⁹ Being patient and knowing the mechanics of breathing are very important when it comes to teaching proper breathing. "If you're not aware of the biology of function, as a teacher you can do more damage than good. Stress on the abdominal region, if it's not balanced with volumes of air and if you don't cover the whole structure, can limit a student, and that can be damaging."¹⁰ This is why it is important to research all aspects of breathing and to know how it works.

9. Kevin Kelly, "The Dynamics of Breathing," *The Instrumentalist* 38 (December, 1983): 10,11.

10. Arnold Jacobs, "Wind and Song," *The Instrumentalist* 46 (November 1991): 21.

CHAPTER 2 THE MECHANICS OF BREATHING

When teaching proper breath control to students, teachers must have a comprehensive understanding of how the breathing process works. If teachers do not fully understand breathing, the students could learn breathing in a way that would not help them succeed in their music, and potentially be physically harmful. "Proper breath control is the foundation upon which the performer of a wind instrument must depend."¹¹ Once a student knows how to breathe properly their odds of succeeding on their instrument will greatly increase. When teaching a student how to breathe, the teacher should not include all of the muscles and processes involved in breathing. This will only confuse students and cause them to breathe improperly. If one teaches the concepts of good breathing, the brain will take care of the muscles. "The firing up of the systems is handled at subconscious levels, just like the ability to walk or to talk or to run. The muscle activity will result from what you are trying to accomplish. With all machines there is a set of controls, like an automobile, which has complex machinery under the hood but simple controls in the driver's compartment."¹² Mechanics know how to drive a car but they cannot fix one without an intimate knowledge of how it

11. Joseph A. Trongone, "Breath Control for Horn Players," *Music Educators Journal* 34, no. 4 (Feb. - Mar. 1948): 40.

12. Kelly, 9.

works, much like a teacher must know how breathing works to be able to fix students. Breathing can be broken down into two major categories: inhalation (breathing in) and exhalation (breathing out). Both are equally important and one cannot happen without the other.

Inhalation occurs when air enters the lungs. "The lungs take up practically all the space in our chest, or thoracic cavity, and are confined by the ribs and intercostal muscles on the sides, and by the diaphragm (made up of muscle) on the bottom."¹³ See Plate 2.1 for a drawing of the lungs in the chest cavity.

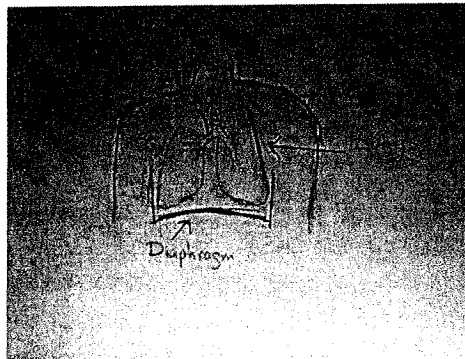


Figure 2.1 – Lungs in chest cavity

There is often a misunderstanding of the lungs' role in the breathing process. The lungs are nothing more than elastic sacks that expand and contract when the muscles around them move. When a teacher tells a student to use more lung pressure or breathe deeper with the lungs, he/she is giving the student incorrect instruction. Air enters the lungs when the costal muscles expand; the abdominal muscles expand, allowing the diaphragm to push downward, creating an empty space in the chest cavity. The air pressure in this empty space is less

13. Dale, 31.

than the air pressure outside the body. This causes the air to rush in through the mouth or nose and into the lungs, filling the empty space, thus giving the lungs a very small role in the actual breathing process. The muscles in the chest cavity and the abdomen are the real “workhorses” of breathing.

The muscles a student engages will determine the type of breath he/she takes. There are three main types of inhalation. The first, and least effective, is high chest breathing, which may also be referred to as clavicular breathing. “Clavicular breathing is inefficient, looks unattractive, and can lead to muscular tension in the throat.”¹⁴ This type of breathing is the most common in students because it is the type of breath they take to sustain life. When a student uses high chest breathing, he/she is only engaging the muscles found in the upper part of the chest and shoulders. The student’s chest will stick out like he/she is at military attention, and the shoulders will rise, as if you just asked him/her a question to which they do not know the answer. This type of breathing allows the least amount of air to be taken in, and the student will not be able to properly support the sound. It is the equivalent of blowing up a balloon but not allowing the bottom three quarters to fill with air.

The next most common type of inhalation is middle-chest breathing or costal breathing. Costal breathing happens when a student uses only the interior and exterior costal muscles to breathe.

14. Susan D. Boardman, "Breathing Your Way to a Better Chorus," *Music Educators Journal* 82, no. 6 (May, 1996): 29.

“There are two overlapping layers of muscles between the ribs, called the interior and exterior costal muscles; some contract during inspiration (breathing in) and some contract during expiration (breathing out).”¹⁵ When the student breathes in this manner, the rib cage will expand, allowing the upper half of the lungs to fill. This type of breath allows much more air than high chest breathing, and the breath will be tension free and flow smoothly since the shoulders are not engaged.

The third type of breathing is abdominal breathing, also called diaphragmatic breathing or deep breathing. Diaphragmatic breathing is the preferred inhalation for all music making. This breath allows the student to completely fill the lungs, allowing a well-supported sound. This type of breath only happens when the student engages the abdominal muscles, allowing the diaphragm to move downward, creating space for the bottom half of the lungs to fill. “The diaphragm is actually a strong, resilient muscle, which lies horizontally across and through the body above the waist. It completely separates the heart and lungs from the organs lying below. It could be compared in shape to a large shallow bowl turned upside down so that it domes slightly upward.”¹⁶ Contraction of the diaphragm increases chest volume by forcing the viscera (stomach and intestines) down, drawing a corresponding amount of air into the lungs, filling the newly created space in the chest cavity.

15. Kelly, 8.

16. Philip Farkas, *The Art of French Horn Playing* (Evanston, Illinois: Summy-Birchard Company, 1956), 28.

“You can really feel the expansion all around the waistline, which is why brass playing too soon after a full meal is not merely uncomfortable but also difficult.”¹⁷

This outward push can only be accomplished by allowing the abdominal muscles to relax, making room as the diaphragm moves down, opening up space in the chest cavity. “For maximum inspiration we must combine diaphragmatic with costal breathing, and in that order; many vocal teachers wisely advise, “breathe down and out, then up.”¹⁸ Once a student has mastered how to breathe in, the next, and often overlooked step, is breathing out.

Exhalation is often the overlooked step when it comes to breathing, even though it is a very important part of the breathing process. When a teacher asks a student to support their sound, the support comes during exhalation. “The airflow must be under control at all times; the player should, in other words, maintain strict control over exactly what his airflow is doing, and over exactly what else is going on in his body to help or hinder the airflow.”¹⁹ In order to be in control of the exhalation, the student must know where inhalation ends and exhalation begins.

17. Clyde E. Noble, *The Psychology of Cornet and Trumpet Playing, Scientific Principles of Artistic Performance* (Missoula, Montana: The Mountain Press, 1964), 68.

18. Noble, 69.

19. David Pino, *The Clarinet and Clarinet Playing* (Mineola, New York: Dover Publications, 1980), 49.

Exhalation begins with the relaxation of the inspiratory muscles. During normal breathing, exhalation is passive and functions without any added force. "In forced exhalation, such as playing a wind instrument, the relaxed diaphragm is lifted by contraction of the abdominal muscles and the chest is drawn in by the intercostal muscles."²⁰ Inhalation and exhalation should be seamless.

"A common breathing fault is to take in a sufficient quantity of air and allow it to become dormant or stagnant, literally 'starving' the instrument. Let the breath flow fluidly through the instrument, especially during moments when the mind is occupied with rapid technical spots, trills, or hard-to-bridge intervals. It is at these moments of concern when the breath is most apt to be idle."²¹

Some teachers will tell students to exhale all the air in the lungs but this can be dangerous. "Residual air always stays in the lungs. Without residual air to keep the lungs inflated, they would collapse."²² This is why, when playing or singing. A student should not wait until their lungs are empty to breathe. While breathing out, the lungs empty to a point at which the body strains to push air. This will cause the student to lose good breath support and fatigue the body. A student should breathe in before they reach this stress point so as to maintain a level of support. The amount of air a student breathes in and out should always be dictated by the music he/she is trying to produce. If the passage of music is

20. Brian Frederikson, *Arnold Jacobs: Song and Wind*, ed. John Taylor (United States: WindSong Press Limited, 1996), 110.

21. Keith Stein, *The Art of Clarinet Playing* (Evanston, Illinois: Summy-Birchard Company, 1958), 20.

22. Frederikson, 104.

only a couple of measures long, then a deep full breath may not be needed. "For overall playing, a breath of 75 to 80 percent of capacity will suffice. Of course, this will vary, depending on the requirements of the music being played."²³ "It is not enough that the musician shall merely breathe. He must breathe the breath of life into his music."²⁴

23. Frederikson, 116-117.

24. W.J. Henderson, *The Art of Singing* (Freeport, New York: Books for Libraries Press, 1968), 27.

CHAPTER 3 POSTURE

Proper posture is one of the most important aspects of which to be aware when breathing. Something as simple as sitting up straight or standing straight can make the difference between being able to breathe correctly or not. "Any slouching, or conversely, uncomfortable rigid position inhibits efficient breathing because the muscles which should be used for proper breathing are either too tense or restricted in some way."²⁵ Since proper posture tends to be easily forgotten when performing, teachers must be aware of student posture at all times. The fact that posture tends to be forgotten is harmful because of the direct effect posture can have on breathing. Letting a student attempt to take a large, deep breath with incorrect posture would be like trying to let them pole-vault with a defective pole. It is not safe and will not produce good results. "There are two criteria by which posture must be judged, in terms of its relationship to musical performance: (1) Does it allow the performer to work in the most comfortable manner, commensurate with good performance? (2) Does it allow for the players most physically efficient and effective performance?"²⁶ After a teacher has identified the posture that best fits these two criteria, he/she should apply this posture to both standing and sitting.

25. Griffiths, 1.

26. Keith Johnson, *Brass Performance and Pedagogy* (Upper Saddle River, New Jersey: Pearson Education, 2002), 21.

When students are performing he/she will either stand or sit. Proper posture is much easier to maintain while standing. "Standing offers the greatest ability to move large volumes of air in and out of the lungs."²⁷ Students are less likely to slouch or contort their bodies when they are standing. "To achieve proper posture while standing a student should have feet comfortably separated, weight so balanced as to make easy its transfer to either or both supports, shoulders back without stiffness, head alert upon a firmly flexible neck, this is efficiency and art in one."²⁸ See Plate 3.1 for an example of proper standing position. Teachers must also be aware that when they tell a



Plate 3.1 – Proper Standing Position.

student to stand up straight, it does not mean go to a military or marching band attention pose. Chin up, shoulders back, and chest out will cause unneeded stress in the body, and the rigid attention position will not allow the chest and

27. Frederikson, 130.

28. Thorpe, 58.

abdomen to expand properly for deep breathing. It is important to keep throat, neck, shoulders, and arms relaxed while exhaling. “If there is tension in your throat, your tone will suffer – become smaller and constricted. If you tighten up on your neck, throat will tighten up. If you do not keep your shoulders down in a relaxed position you will tense up your neck and throat.”²⁹ See Plate 3.2 for an example of Military/ Marching Band Attention Posture.

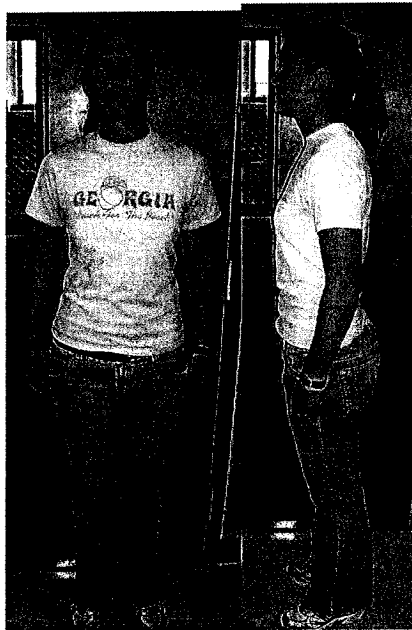


Plate 3.2 Military/ Marching Band Attention Posture.

After students know what proper posture is when standing, they must learn to apply this to sitting. Most of the time instrumentalists will be sitting while they perform. “Standing while seated (in the upper body) is the best posture because players have the greatest ability to move air in and out of the lungs”³⁰.

29. Art Lehman, *The Art of Euphonium Playing* (TUBA Press, 1993), 5.

30. Kelly, 12.

Students are more likely to forget about posture while sitting. They slouch in the chair to find the most comfortable position, which requires the least amount of effort and this is usually not conducive to good breathing. "A body that is slumped or twisted will put the lungs in an abnormal position and will prevent the diaphragm and other muscles used in correct breathing from functioning in the proper manner."³¹ One of the biggest contributors to poor posture when sitting is the position of spine on the hips. If the spine is not positioned directly over the hips it will greatly reduce the amount of air that can be taken in. When the hips are rolled slightly back the diaphragm will not be able to push the organs of the abdominal cavity down and out, keeping the lower portions of the lungs from expanding. "A good test of body balance when one is in a sitting position is to ask the student to stand quickly. If he has to shift too far forward in order to rise, his posture is not balanced."³²

When a student is using the proper body alignment, he/she will look alert and ready to play. As a teacher, it can be very hard to spot a student who has rolled the hips because there is very little difference correct and incorrect postures. See Plate 3.3 for proper sitting posture and 3.4 for improper hip position. After students have learned how to use proper posture while sitting, they must not let their posture suffer because of an instrument.

31. Norman J. Hunt, *Guide to Teaching Brass* (Dubuque, Iowa: Wm.C. Brown Company Publishers, 1968), 35.

32. William Spencer, *The Art of Bassoon Playing* (Evanston, Illinois: Summy-BirchardCompany, 1958), 46.

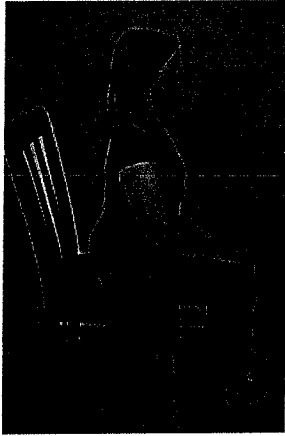


Plate 3.3. - Proper Sitting Posture.

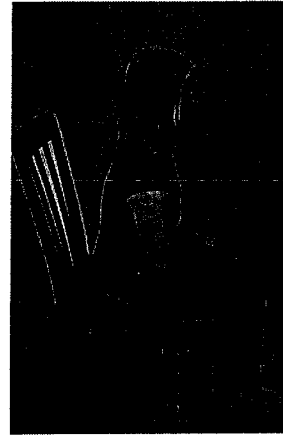


Plate 3.4 – Improper Hip Position

Oftentimes an instrumentalist contorts his/her body to play the instrument. “For all winds, the correct playing position is based on moving the instrument to the player, the mouthpiece to the face and lips. It is not desirable to bring the player to the instrument or to adjust the head and shoulders to the position of the mouthpiece.”³³ Saxophone, flute/piccolo, and tuba are three instruments that can cause more problems than other instruments. With the saxophone the student must make sure the neckstrap is adjusted appropriately. The right hand must be pushing the instrument forward so the mouthpiece enters the mouth in a way that does not force the head to move. The mouthpiece must also be rotated so the head can stay in line on top of the neck. With the flute/piccolo, the teacher must make sure that the right elbow is pointed down. If it is pointed off in a different direction, tension will be created in the shoulder and transferred into the neck, disrupting the flow of air. See Plate 3.5 for proper saxophone and 3.6 for flute playing position. Because of the size of the tuba, students will often set the

33. Richard J Colwell and Thomas Goolsby, *The Teaching of Instrumental Music* (Englewood Cliffs, New Jersey: Prentice Hall, 1992), 13.

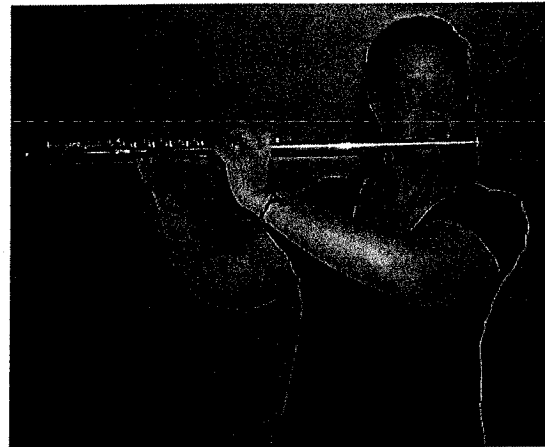


Plate 3.5 – Saxophone Playing Position Plate 3.6 – Flute Playing Position

instrument on the edge of the chair and contort the body to play. To bring the instrument to the student requires either using a block, a stand, or setting the instrument on the lap and adjusting the legs.

Sometimes when a student places the tuba in his/her lap, it will slide around making it difficult to play. This may be avoided by placing a piece of shelf paper across one leg. Shelf paper is an inexpensive rubbery paper that is designed to go on the bottom of shelves to keep cans from sliding around. It also works on the tuba. Draping a piece of shelf paper across one leg will hold the tuba in place while the student plays. The student may also make a block out of cork or whatever is handy to place on the chair so the tuba can rest on it and raise the instrument so that the student does not have to lean over to play. The last option is to buy a tuba stand that can be placed on the ground in front of the chair. This stand may be adjusted so that the tuba is raised enough that the student does not have to lean over to play. Another benefit of the stand is that it takes the weight of the instrument off the player. All the student will have to do is

steady the tuba while playing. See plate 3.7 for proper tuba posture with instrument the lap and 3.8 with instrument on a stand.



Plate 3.7 Tuba Posture with Instrument on Lap 3.8 Tuba Posture on a Stand

It is very important to make sure that the position of the instrument does not affect posture. All time spent teaching proper breathing will be lost if the student picks up the instrument, and it stops him/her from being able to breathe properly. Placing a diagram in the room is a constant reminder that students can see and to which teachers can refer during class.

A good diagram to use is the Amazing Stick Man created by David Robinson at Knob Noster R-VIII schools. This works very well at the middle-school / junior-high level but can also be used at the high-school level. See Plate 3.9 for the Amazing Stick Man. One thing to remember is that a student should play the instrument, not let the instrument play the student.

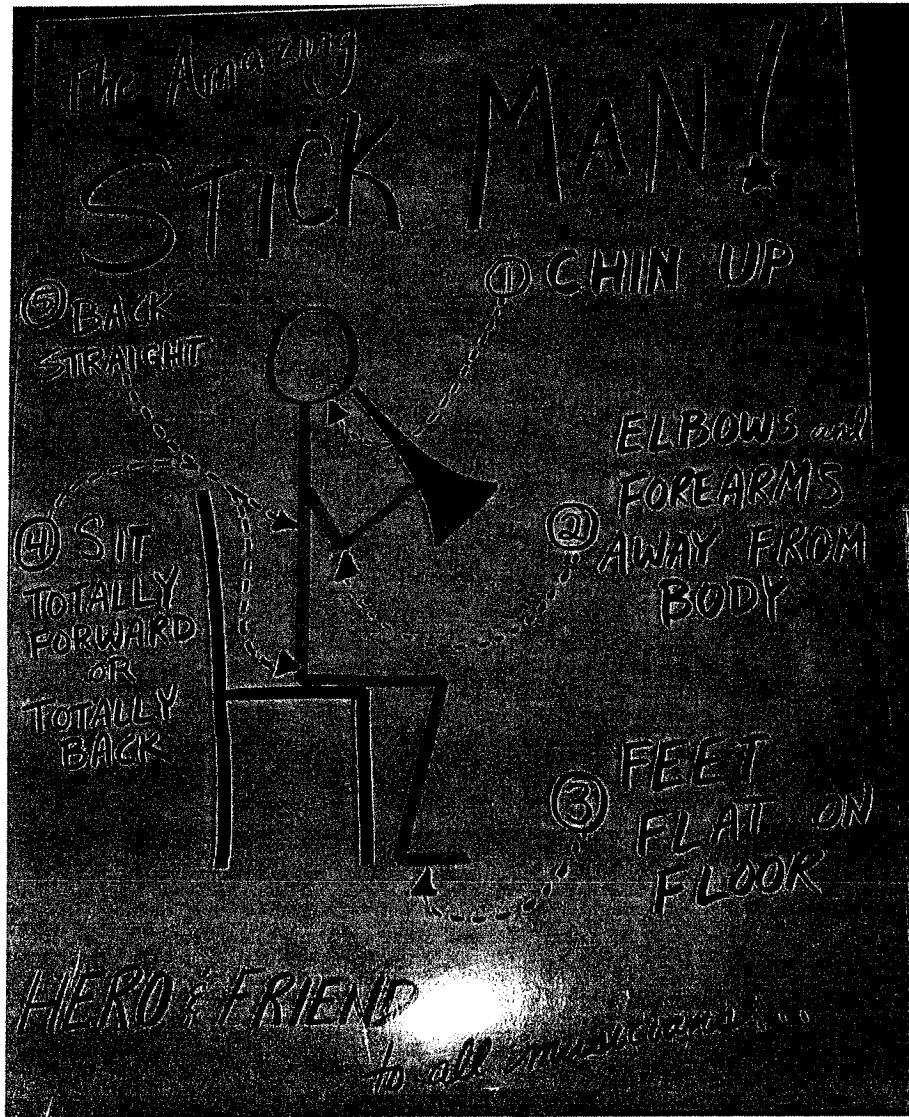


Plate 3.9 The Amazing Stick Man

CHAPTER 4 TOOLS TO AID AND MEASURE BREATHING

Breathing can be a difficult subject for students to understand because it is something that is hard to see. They can watch a teacher demonstrate proper breathing, but all they see is what is happening from the outside. They cannot see the muscles inside the chest and abdomen actually moving, or the lungs expanding. There are tools available to teachers that will bring the teaching and understanding of breathing out of the dark and into the light. Even though the student cannot see what is going on inside when he/she breathes, the use of tools can allow them to measure and track their breathing, giving concrete evidence of their breathing. Some tools that are available are very easy to use and are inexpensive. These tools will allow the teacher to measure breath and allow the students to feel what it is like to take a true breath.

The “McAdams” Breathing Apparatus is used to demonstrate proper inhalation, not measure it. The breathing process is broken down into two steps; inhalation and exhalation. “The “McAdams” Breathing Apparatus is really good for inhalation it doesn’t really do anything for exhalation. The McAdams Breathing Apparatus helps give you the physical feel of what is necessary to inhale correctly.”³⁴

34. Charles McAdams, Dean of the College of Arts and Sciences, Northwest Missouri State University, Interview by author, 01 March 2008, Liberty, MO, Mp3 audio recording.

The Breathing Apparatus consists of a small piece of PVC pipe or a rolled up piece of paper. The pipe is preferred because it will not fall apart after it gets wet from being in the students mouth. To use this device, the student places the pipe between his/her teeth, bites down slightly to steady the pipe and makes sure the tongue is low in the mouth, then breathes. This will make the throat open up in a very round shape and allow the student to breathe in with very little resistance. The student should then try to simulate this without using the Breathing Apparatus. This device should be kept in the case and used to remind the student what a correct inhalation should feel like as often as needed. See plate 4.1 for an example of the “McAdams” Breathing Apparatus. Another tool that helps with inhalation as well as exhalation is the Breath Builder.

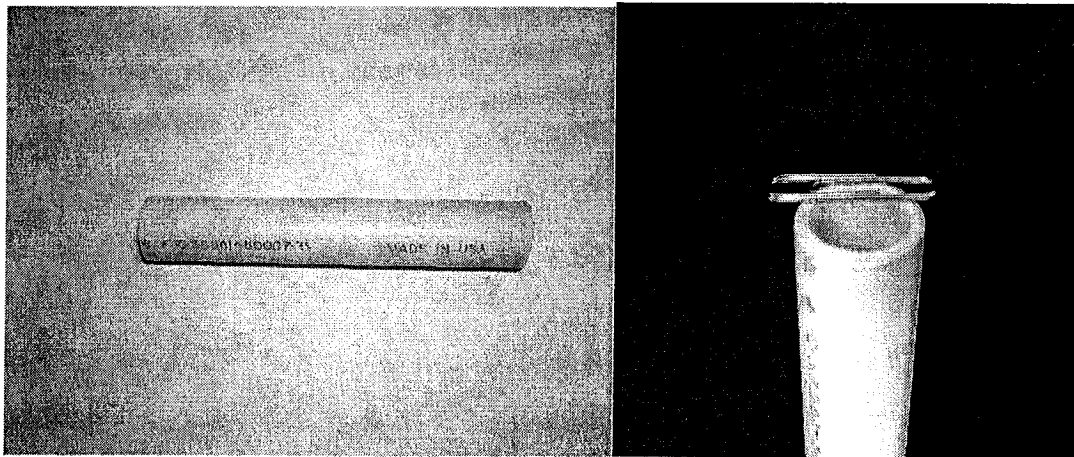


Plate 4.1 – “McAdams” Breathing Apparatus

The Breath Builder is a tool that allows students physically to feel what muscles are involved in breathing. It creates resistance when one inhales and exhales, thus forcing the muscles that a student uses to breathe to work harder than normal. This device is a tube that is sealed on the bottom and has holes on

the top. Also on top is a plastic tube that sticks out. Inside the tube is a ping-pong ball. See Plate 4.2 for a picture of the Breath Builder. When the student uses this device, he/she must put the tube in his/her mouth, between the teeth. When he/she breathes, he/she must keep the tongue out of the way so the air can move freely. One must keep the ball at the top of the tube while breathing. The three holes at the top are used to create different amounts of resistance by covering them with fingers. It also comes with two different sizes of tubes that help vary the resistance.

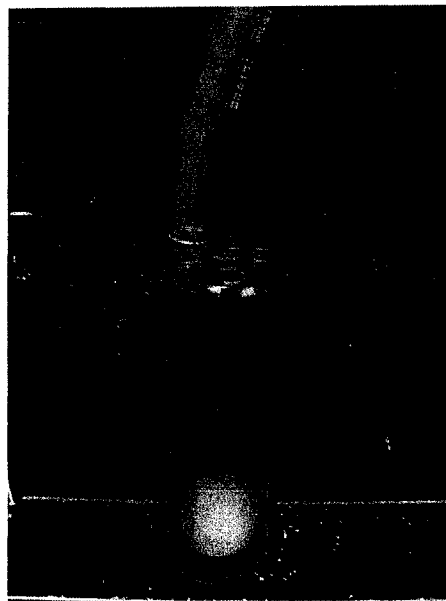


Plate 4.2 – Breath Builder

“In use, visualize a string player bowing from frog to tip. Keep the motions of inhalation and exhalation as long as possible, increasing the length of the bow. Find the minimal function to keep the ball at the top. Look in the mirror and observe the body’s motions to keep the wind moving with minimal effort. Exaggerate inhalation [expansion of the body] and exhalation [contraction of the body].”³⁵

The Voldyne 5000 is an inexpensive tool that can only be used for measuring inhalation. This instrument measures how many liters of air a student can inhale, up to five liters. The device has two chambers: a larger one that measures how much air you breathe in and a smaller one that tracks how fast you are taking air in. To use this device, the student places the mouthpiece at the end of the tube between their teeth, keeping the tongue down and out of the way. One must then breathe in as fast as one can to measure how many liters of air can fit into the lungs. The measuring device in the large tube will rise slowly, showing the amount of air being inhaled. The device in the small chamber should rise to the top and remain there until the student stops breathing.

This device comes with instructions that say to breathe in slowly, but to get a true measurement of lung capacity the student needs to breathe in very quickly. See plate 4.3 for a picture of the Voldyne 5000. The student should only inhale with this device a couple of times at each use. Extended use could cause hyperventilation. This device can be used to track a student's progress, giving them goals for which to strive and allowing them to see that doing breathing exercises on a regular basis can increase their lung capacity and give them better control of their exhalation.

35. Frederikson, 175.

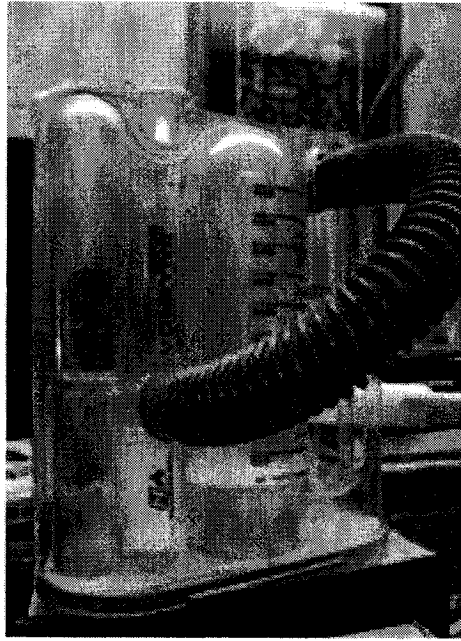


Plate 4.3 – Voldyne 5000

The TriFlo is a device set up similar to the Voldyne 5000. It has three chambers, with each chamber having its own ball. To use the device the student places the mouthpiece at the end of the tube between his/her teeth, keeping the tongue low and out of the way. The student should then take a deep breath as fast as he/she can. When the student breathes in, the appropriate ball will rise to the top of its chamber, indicating how fast the student is inhaling. These chambers measure intake of 600, 900, and 1200 cc per second of air. It also allows a student to track the rate at which he/she is breathing. One can experiment with breathing steadily at 900 cc per second, allowing one to gain better control of inhalation. To measure exhalation, the student simply turns the TriFlo upside down and repeats these steps. See Plate 4.4 for a picture of the TriFlo.

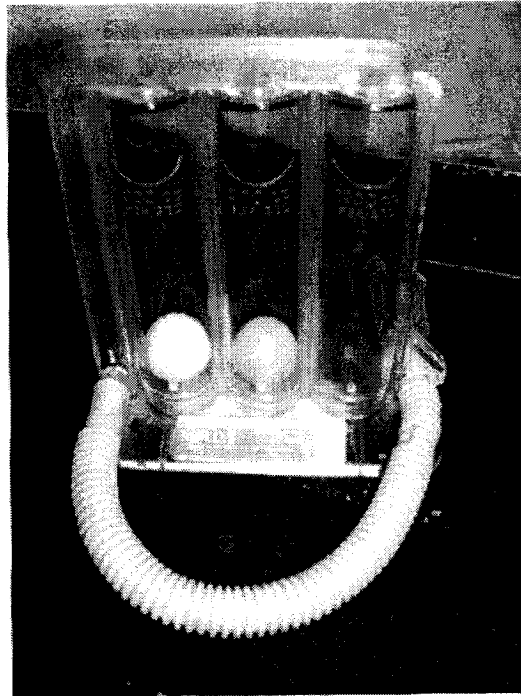


Plate 4.4 – TriFlo

Another inexpensive tool for measuring exhalation is the Peak Flow Meter. This device measures how air is moving out of the lungs. It is used only to measure exhalation. The mouthpiece is placed in the student's mouth, making sure that the tongue is down and out of the way, and that the lips form an airtight seal. The student then exhales as fast as possible. The pointer on the meter will move to show the amount of air that the student exhales. This process should be repeated three or four times, and the best exhalation should be recorded. After each use of the meter, the pointer must be reset by carefully moving it. Breathing in will not reset the device. See Plate 4.5 for a picture of Peak Flow Meters. Using this device in conjunction with the other devices will allow the teacher to estimate the lung capacity of students. The instructor should

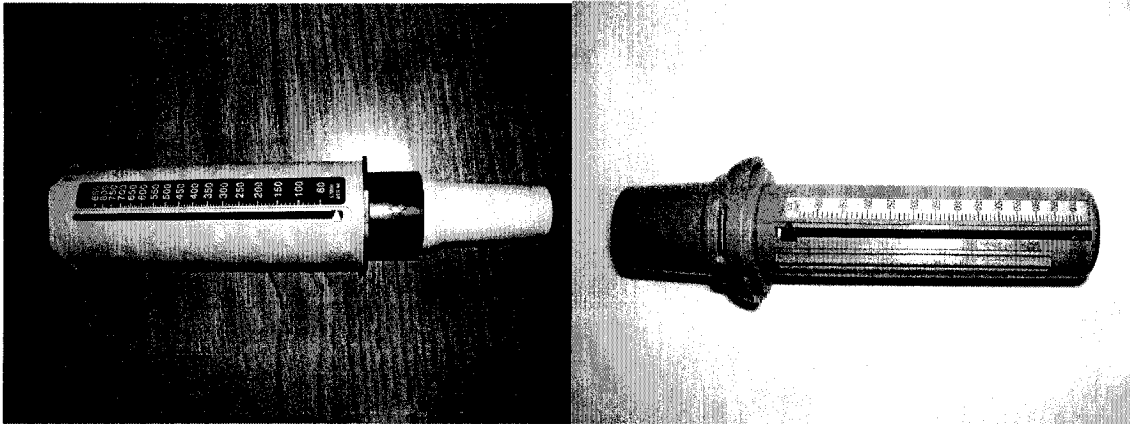


Plate 4.5 – Peak Flow Meters

and techniques to expand breathing. Students can see their progress while teachers will be able to adjust which techniques they are using to achieve maximum results. If there is ever any question about how to properly use these devices, contact a Respiratory Therapist before using them on students.

CHAPTER 5 TECHNIQUES AND EXERCISES

When a student understands how to breathe properly, he/she must practice that breathing to make it a habit. Otherwise, he/she will revert to a way of breathing that is natural but insufficient for playing or singing. Doing exercises on a regular basis will not only keep the students breathing properly but it will make them better at it. Their lung capacity will increase, as will their ability to control the air they are using. "Occasionally, a student may feel dizzy during or after the breathing exercises. This is a natural occurrence caused by a higher level of oxygen in the brain than usual and is not dangerous if the student stops the exercise as soon as the dizziness begins."³⁶ The more that the students practice the exercises, the less they will become dizzy. While doing these exercises, students' sides may become sore. This is a natural part of learning to use muscles in a new way. This soreness fades in time. The teacher should warn students about the dizziness and soreness they may be about to endure, and get down to the business of working on breathing.

When teaching breathing, the first thing that a teacher should do is demonstrate what proper inhalation looks and sounds like. "A good inhalation has a very distinct sound. It has two specific, easily recognizable characteristics: it sounds full and it sounds free-flowing."³⁷ When breathing in, the lips should be

36. Boardman, 30.

37. Johnson, 28.

in an O shape and the sound “hoe” will be heard. Because muscles are usually controlled by reflex rather than by direct thought, the teacher must resort to indirect methods of suggestion: 1) ask the student to yawn and concentrate on how the throat feels; 2) have the student exhale warm air on the hand as is often done when steaming eyeglasses for cleaning.³⁸ A good example of what a proper, free-flowing breath sounds like is the way Darth Vader from the motion picture “Star Wars” breathes. Most students will know what that sounds like and begin to imitate it as soon as Darth Vader is mentioned.

Another way to achieve proper inhalation is to have the student use a Breathing Apparatus, then take it away and have the student try to imitate the breath they achieve with the apparatus. While working on breathing, the teacher should always make sure the student is breathing deeply, and sitting or standing with proper posture. One additional way of easily getting students to inhale properly is to have the student lie down on their back and breathe. Lying on the ground will force the students to engage the muscle for deep breathing and stop the shoulders from rising. After the students have learned how to breathe in properly they must learn how to breathe out.

Exhalation is the part of breathing where support happens. When the teacher asks the student to support their sound the student must adjust how the air is leaving the body. Much like inhalation, methods of suggestion and

38. Spencer, 47.

breathing tools are the best way to teach support. “The blowing up of balloons, coughing while placing the thumb and fingers around the waist just below the lower ribs, and laughter of the body-shaking type are great ways for the student to feel the muscles at work.”³⁹

A great tool for getting the muscles working is the Breath Builder. Keeping the ping-pong ball at the top of the tube makes those abdominal muscles work much harder than normal. “Hissing air between the teeth while exhaling is also recommended in order to more closely approximate the resistance to air pressure, which exists when actually blowing into an instrument.”⁴⁰ A good visual image is to tell students they need to float a paper airplane across the room on a stream of air they create. The plane needs to travel smoothly, with no bumps in the air, so the stream needs to be very even from start to finish. After the students have mastered inhalation and exhalation, it is time to work on controlling the air.

When students are learning to control their breathing, they should use a metronome. Metronomic breathing will allow students to practice breathing evenly. First set the metronome to a moderate tempo and have the student breathe in evenly over four counts and out over four counts. Make sure they do not inhale rapidly for one count and hold for three. They should also take all four

39. Spencer, 46.

40. Daniel L. Kohut, *Instrumental Music Pedagogy: Teaching Techniques for School Band and Orchestra Directors* (Champaign, Illinois: Stipes Publishing, 1996), 106.

counts to exhale. Once they have mastered breathing in and out over four counts, have them do the same over three counts. When they can do three counts, go down to two and finally to one. A student may start to get light-headed during this exercise. When this happens, he/she should sit down and breathe through his/her nose. After mastering breathing in and out in equal counts, have them breathe in for one and out for four. This exercise is more like what they will encounter while playing or singing. Once in for one and out for four is mastered, have them breathe in for one and out for six. Then out for eight and so on. The teacher may also shorten the amount of time the student has to breathe in as well. Have him/her breathe in for a half count then out for four and so on. This exercise will help students play through longer slurs and allow them to manage their air better. If they are not playing evenly through a section of music that is slurred, have the student blow air through the instrument while fingering the passage. This will allow the teacher to hear how they are managing the air and fix any problems. Good air is always flowing in and out of the body.

Music is tonal motion that could not occur without the flow of air. Whether the air is flowing to support life or create sound, it should be stress-free. Air that is used to create sound needs to have proper support and be under control at all times. This will happen when students begin to think about the breathing process, use proper posture, and practice the exercises/techniques they are taught. After students have better control of their breathing, they will be able to move past the notes on the page and breathe life into music.

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APPENDIX
HUMAN SUBJECTS APPROVAL

November 8, 2007

CHRISTOPHER BARRIER
3675A WOODS CT.
SEDALIA MO/65301

Dear Mr. Barrier,

Your research project, "Thesis-Breathing Techniques" was approved by the Human Subjects Review Committee on November 8, 2007.

Please note that you are required to notify the committee in writing of any changes in your research project and that you may not implement changes without prior approval of the committee. You must also notify the committee in writing of any change in the nature or the status of the risks of participating in this research project.

Should any adverse events occur in the course of your research (such as harm to a research participant), you must notify the committee in writing immediately. In the case of any adverse event, you are required to stop the research immediately unless stopping the research would cause more harm to the participants than continuing with it.

If you have any questions, please feel free to contact me (660-543-4621).

Sincerely,

David S. Kreiner, Ph.D.
Associate Dean of The Graduate School
kreiner@ucmo.edu

Approved Co-Investigators:

pc: Dr. J. Franklin Fenley