

Starting Early with Injury Prevention Strategies: Incorporating Non-playing, Educational Activities into Flute Lessons for Young Beginners

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Much has been written by flute players and educators, as well as experts in the field of performing arts health, about the awkward flute playing posture, in which the arms are held against gravity, in a unilateral position (Debost, 2002; Edmund-Davies, 2008; Lonsdale, 2014; Moratz, 2010; Watson, 2009). The prevalence of musculoskeletal symptoms in the international flute community, as well as flute-playing related health are topics that have been addressed by researchers internationally, in dissertations (Fain, 2009, Fortune, 2007; Lonsdale, 2011; Matejka, 2009), books (Pearson, 2006), and journal articles (Lonsdale, 2012, 2014; Nemoto & Arino, 2007; Norris, 1996; Spence, 2001; Stanhope & Milanese, 2016).

Playing-related physical problems occur not only among professional orchestral musicians, but also among amateurs and students (e.g. Brandfonbrener, 2009; Roach, Martinez, & Anderson, 1994), and children (e.g. Ranelli, Straker, & Smith, 2011).

The National Association of Schools of Music (NASM) and the Performing Arts Medicine (PAMA) in the USA have compiled a set of recommendations for music schools, faculty and students, which are designed to give a greater awareness of the risk factors associated with playing instruments, and how to prevent playing-related problems from occurring. All of the advisories can be accessed at <https://nasm.arts-accredit.org/publications/brochures-advisories/nasm-pama-nms-vocal-health/> Contributing factors to musculoskeletal injuries are often due to overuse/misuse and genetic factors (e.g. gender, anatomy). Many musculoskeletal problems are preventable, so it is important that teachers and players understand the risk factors for injuries. Among the modifiable, contributing factors to injury are:

- poor body alignment and/or positioning;
 - poor quality of movement (e.g. stiffness, limited movement);
 - poor management of time (e.g. extended periods of playing without breaks or rest)
 - physical problems such as poor conditioning
 - psychological problems such as stress and depression
- (NASM-PAMA, 2014a).

NASM-PAMA (2014a, p. II-11) states that “Proper body alignment, including good balance and body positioning, is vital to the continued health of musicians.” Therefore, teachers play a key role in preparing their students for a long and healthy playing life:

As educators, you and your colleagues are tasked with preparing the next generation of musicians. Some may go on to play professionally, others may decide to teach, and still others will embrace music as a life-long hobby. Whatever their future aspirations, students’ neuromusculoskeletal health is vital to their success as musicians and to their overall happiness. (NASM-PAMA, 2014a, p. II-19)

Flute Playing-Related Pain and Playing Position

It is common for flute players to experience shoulder, neck and back pain (Lonsdale, 2014; Spence, 2001). In a study of 731 Australian children aged 7-17 years, Ranelli et al. (2011)

found that the left hand was also a problem area for flute players (n=61). Similarly, Brandfonbrener (2009) found that among freshmen student musicians (first year university students), 87% of 71 woodwind players had a history of playing-related pain. It is therefore important to remind flute players of the need to take regular rest breaks, adopt an efficient playing position, play with freedom of movement (avoid muscle tension), and be aware of contributing factors to injury.

As young flute players tire, it can be difficult to maintain good balance and body positioning. The flute has a natural tendency to roll backwards, and can therefore be challenging to hold for beginners, particularly young children. Some beginners compensate for the awkward playing position by raising their shoulders, wrists, elbows, or allowing their head to tilt excessively (Debost, 2002; Edmund-Davies, 2008; Lonsdale, 2014; Moratz, 2010; Watson, 2009). Dawson (2008, p.25) states that “Beginning instrumentalists need precise and usually repeated instruction in correct posture and use of body mechanics for holding and playing any instrument whether while sitting or standing. They need to learn just how much muscle activity (strength and speed) is needed, and from which muscles, to produce the right sounds.” However, many flute teachers have indicated that they received little to no instruction on injury prevention and management during their training (Lonsdale, 2011, 2014).

As the flute playing position can be tiring for children, it can be helpful to take breaks from playing, by incorporating non-flute playing activities in their lessons. This article includes a brief review of several commonly used flute tutor books for beginners, followed by suggestions as to how flute teachers can incorporate non-playing, educational music activities that can be included into lessons for beginner flute players, as they are developing the strength and stability to hold the flute correctly. The suggestions in this article are based on recommendations in the performing arts medicine and ergonomics literature, as well as the personal flute teaching experience of the author for over three decades.

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A Review of Beginner Flute Tutor Books

While the performing arts medicine literature highlights various risk factors for playing-related injuries, few authors of flute tutor books appear to consider these when designing instructional materials for beginners. This review focuses on beginner flute tutor books written in the English language that are commonly sold and used internationally. The review is grouped into three sections: Flute tutor books published from the 1930s to 1970s, flute tutor books published from the 1980s to 1990s, and method books published since the year 2000.

Tutor Books Published from the 1930s to 1970s

Tutor books published from the 1930s to 1960s have been included in this review as they are still widely available for sale internationally, including through major retailers of flute music such as Flute World (USA), Just Flutes (UK), as well as online bookstores such as the Book Depository (UK), and Amazon (USA). One example is the *Rubank Elementary Method - Flute or Piccolo* (Petersen, 1934) which is still readily available online, despite being an older method book. The Rubank book includes no information on alignment, posture or tips on technique.

Learn to Play the Flute! Book 1 (Jacobs, 1969) gives a few tips on alignment, including “Do not raise your shoulders.” (p.4). The author recommends a “smile and pucker” position (p. 11) and to “Tighten the corners of your mouth and pucker forward slightly, making the opening rounder.” Yet, this type of embouchure position is widely discouraged in modern times because of the physical tension involved in maintaining this embouchure (Ely & Van Deuren, 2009, p. 208)

A Tune a Day for Flute, Book One (Herfurth & Stuart, 1953) was a popular method book that was used internationally up until the introduction of the new version of the book which was published in 2006. The introductory pages of the book include information and diagrams on correct positioning and posture, (pp. v, vii). The book provides several pages of ‘test questions’ and theoretical activities which provide the student with a break from playing, while testing their knowledge of musical principles introduced in the earlier pages.

The *Suzuki Flute School - Volume 1 Revised Edition* (Takahashi, 1971) provides some advice on posture, breathing, breath control, embouchure, flute assembly and balancing the flute (pp.9-10). Similar to other publications in the 1960s and 1970s, the author recommends to “Tighten and advance your lower jaw a little” and that the “Lips should be lightly pulled out at both sides” (p.12). As there is now greater knowledge in the area of injury prevention and musicians’ health, “pulling” (Takahashi, 1971), “tighten” or “tightening” (Jacobs, 1969; Takahashi, 1971), are not typically encouraged by modern day flute teachers. However, the topics of flutist health and musicians’ health were not addressed in the literature until the mid to late 1980s, when the speciality area of performing arts medicine was being developed. Therefore, it makes sense that prior to this time, there was also little discussion about flutist health in instructional flute books.

Flute Tutor Books Published from the 1980s to 1990s

Learn As You Play Flute (Wastall, 1989) includes a brief section on flute alignment, hand, thumb and lip positions (p.2). Throughout the book there are some playing tips, mostly focusing on musical or technical aspects of playing, but some focus on physical matters such as balancing the flute (p.25) and blowing (p.51).

Flute Class (Wye, 1992) is a group teaching book which includes flute music as well as piano accompaniments. The book includes information and diagrams about flute alignment, hand positions, as well as the recommended position for the head while blowing the flute (pp. 2-4).

AMA Flute 2000 (Winn, 1998) provides numerous clear photographs and diagrams showing the holding and blowing position, flute alignment, as well as hand, wrist and feet positions. Winn emphasizes the need for using hand positions that are “relaxed and comfortable” (p. 47). The book also provides breaks from playing in the form of quiz pages, as well as numerous playing tips throughout the book, which remind the student about correct positioning, and the need to avoid tension. For example, Winn (p.55) states that “It is very important that the student is not frightened of D so that he doesn’t grip too much with the hands or stress the lips.”

Flute Tutor Books Published Since the Year 2000

Play Flute Today! A Complete Guide to the Basics (2001) is described on the cover of the book as “The Ultimate Self-Teaching Method”. The book includes some specific information on posture (pp.4, 22), breathing (p.4), flute assembly (p.6) and finger and hand positions (pp.7, 25),

as well as some diagrams on correct positioning (pp.4-7). The book includes some non-playing activities and suggestions such as fingering the notes without blowing, singing, whistling and speaking the names of the notes (p.26).

A Tune a Day for Flute Book 1 (Bennett, 2006) is a revised version of a popular and commonly used method book. Lesson 1 includes information and images on breathing, tonguing and embouchure position, as well as holding the flute (pp. 8-9).

Abacadabra Flute – Third Edition (Pollock, 2008) is described on the back cover as the “perfect book for pupil and teacher” but includes no information on flute alignment, posture, or the physical aspects of playing. The authors state in the introduction on the inside front cover of the book that “Teaching notes have been kept as concise as possible; no text can replace a good teacher.”

Sally Adams’s Flute Basics (Adams, 2013) is a flute method designed for both individual and group learning. The book includes activities which break up the playing sections, such as using the head joint of the flute, clapping, theory, and composition exercises, breathing exercises, as well as games and quizzes. There is no information about posture, body alignment, or the physical aspects of playing, beyond flute assembly and breathing.

The Young Flute Player; Book 1 (North, 2016) includes studies, scales, pieces, duets and exercises, as well as non-playing activities. Karen North has included games and other activities to break up the playing components of the lesson, such as naming notes (p.23, p.37, p.43), composition exercises (p.26, p.39, p.43), and theory quizzes (p.35).

As the review indicates, many instructional books for beginner flute players provide little information about injury prevention and management, despite flute playing injuries being common in the flute playing community. It is therefore important for teachers to provide students with information and advice about playing-related health and safety, including tips on how to organize a practice session, e.g., when to take breaks; and information about ergonomic flutes and modifications. Beginner flute players should be aware of their movement while playing, to avoid unnecessary physical tension and psychological stress, which can lead to injury. Like athletes, it is important for young flute players to understand that injuries can occur, and take steps to minimize the risks, including modifiable risks such as organizing time effectively, taking sufficient rest and breaks, avoiding unnecessary repetition when playing, as well as sudden increase in practice times (NASM-PAMA, 2014a, 2014b).

Incorporating Principles of Periodization into Teaching Beginner Flute Players

Athletes not only train for optimal performance, but also to minimize the possibility of injury. Training methods are based on scientific knowledge, and focus on general fitness such as endurance, strength, speed, flexibility, co-ordination, sport specific skills, technical skills, tactical abilities (competition strategies), psychological preparation, as well as theoretical knowledge and injury resistance. This may include warm-ups and cool-downs, stretching, training opposing muscle groups, progressively overloading the body to adapt to new conditions, as well as periodization. Included in an athlete’s training program is time for rest and recovery, an essential component of periodization which is intended to prevent injuries from occurring (Bompa & Carrera, 2005; Bompa & Haff, 2009). Manchester (2008, p.46) suggests that incorporating basic principles of sports periodization into music practice may be worth considering.

In the early stages of sports training, athletes emphasize general fitness, as well as stability and control, before focusing on aspects such as agility, aerobic endurance, and other

sport-specific activities. Training is in phases over a period of weeks or months. In the early stages, the aim is on “progressive adaptation” with a view to avoiding the need for later rehabilitation (Bompa & Carrera, 2005, pp.22-23). Resting the body after training is an important part of the cycle for sports people (Manchester, 2008; Wilmore & Costill, 2004), yet traditionally, musicians are often told that ‘practice makes perfect’, or ‘practice, practice, practice’, rather than discussing the need to include rest as part of the training schedule. Practicing intensively to the point of complete fatigue can lead to or worsen overuse injuries, so musicians need to ensure that they take breaks, get enough rest, and use different muscle groups during a playing session (Llobet, 2007). Similarly, in the performing arts medicine literature, musicians are advised to emphasize stability and control, as well as use correct positioning in the early stages of learning (Dawson, 2008; Debost, 2002). Blanchard & Acree (2007) and Debost (2002) agree that gradually easing beginners into practice and emphasizing a slow and careful approach may prevent later problems which need correction. Varying practice also results in better retention of information, rather than constant practicing (Magill, 2007).

Ergonomics

Dul & Weerdmeester (2011, p.5-41) describe ergonomic principles that are central to avoiding local mechanical stresses as a result of poor posture and movements that can cause physical problems such as back, shoulder, neck and wrist pain, and some of these principles could readily be incorporated into the lessons and practice sessions of young beginner flutists, for example:

- “Alternate postures as well as movements”;
- “Limit the duration of any continuous muscular effort”
- “Prevent muscular exhaustion”

As holding the weight and length of the flute can be difficult for beginner players, one way for teachers to emphasize a careful approach would be to alternate playing with non-playing activities such as theory, aural, musicianship, general knowledge, rhythm games, quizzes, listening to recordings, or learning about stage etiquette, such as bowing and walking on and off stage.

Incorporating Musical Games into Lessons: Breaking Up Playing with Non-Playing Activities

The range of skills that a musician needs to prepare for any given performance is broad and can take years to develop and refine. In addition to technical facility, musicians need an understanding of the history of music, stylistic performance practice, harmony, rhythm, phrasing, theory, pitch control, stage etiquette, not to mention having the fine motor control, co-ordination, confidence, ensemble skills, breath control, and concentration to deliver an effective performance. A musician also needs the physical endurance to be able to practice for extended periods, sometimes in reasonably static positions. This type of endurance can be developed over time, but good positioning should never be compromised in the early stages of learning.

Foundational aspects of practical and theoretical musicianship need not only be taught through playing an instrument: Non-playing, educational music activities can be used to give

students a good understanding of aspects such as rhythm, melody, articulation, dynamics, technique, breathing and general musicianship. Recent studies suggest that playing games is important for children in their learning and development (Hassinger-Das., et al., 2017) and that games-based learning could supplement and enhance the educational process at various ages (Hainey, et al., 2016). A few examples of games that can be included in the lessons to break up the physical challenges of holding the flute, while gaining essential musical knowledge are:

1. Practical rhythm games, such clapping exercises;
2. Musical quizzes, including general knowledge questions;
3. Theory and composition exercises

Rhythm Training

As the flute can be tiring to hold for young children, rhythmic training can be useful in introducing new note values, as well as practicing already learnt rhythms. By clapping rather than playing, the teacher can incorporate the regular breaks that will “prevent undue physical stress and strain” (NASM-PAMA, 2014b). Practicing rhythmic drills such as the one shown in Figure 1 (Appendix 1) can also be a productive way to use the lesson time if the student’s flute is being serviced, or if their parents prefer their child to have a longer lesson time than usual.

In the example shown in Figure 1 (Appendix 1), the teacher and student can clap the parts in the exercise separately or together as a duo. Alternatively, two or more students could clap one part through, then swap to the other part on a second reading of the exercise. This exercise contains the typical note values in common time that could be taught in the first few lessons of learning the flute, including semibreves, minims, crotchets and quavers. The student could later progress to exercises such as those shown in Figure 2 (Appendix 1), which introduces ties, simple duple time (2/4) and simple triple time (3/4), as well as crotchet rests. The given exercises are intentionally basic, so the teacher can later incorporate games using more complex rhythms as the student learns other note values.

As well as reading these rhythms, the teacher may wish to include improvisations using the various note values that have already been learnt by the student. Rhythmic concepts, expression, as well as ear training and can also be effectively taught through Dalcroze Eurythmics, which was developed by the Swiss composer and music educator Emile Jaques-Dalcroze. In this method, children use their whole bodies to learn music and improvise (Velikova, 2015). The following website discusses the Dalcroze method in greater depth: <https://dalcrozeusa.org>

NASM-PAMA (2014a, p.II-15) advises that musicians should take breaks “from practice and rehearsal whenever possible. A good rule of thumb is a 5-minute rest every half hour.” This advice is given for more experienced players, and often young children will only be able to sustain playing flute in an ergonomically sound position for much shorter durations (Blanchard, 2007, p.711; Lonsdale, 2011, p.197; Louke & George, 2010, p.3). Musical concepts can be taught in other ways besides flute playing, including through educational musical games. Many musical games can be found online, as well as in various flute publications. A few ideas for games will be presented here.

Online Games for Beginner Musicians

Numerous websites offer free games to test music theory knowledge. One example is the Music Tech Teacher website www.musictechteacher.com which provides over 130 quizzes for elementary (primary) and middle school students. Students can answer questions about note reading, for example:

- “Lines and Spaces Music Quiz” http://www.musictechteacher.com/music_quizzes/aq_lines_and_spaces/quiz.html
- “Tempo Marks Word Search” http://www.musictechteacher.com/music_quizzes/quiz_wordsearch_006_tempo_marks.htm
- “Identify the Key Signatures Music Quiz” http://www.musictechteacher.com/music_quizzes/aq_identify_the_key_signature/quiz.html

Similar theory quizzes for beginners may be found at the following websites:

- Musictheory.net <https://www.musictheory.net/exercises/note>
- Tonic Tutor <https://www.tonictutor.com>
- Susan’s Leigh’s Music Theory Games <http://www.learnatune.co.uk/music-theory-games.html>

Books Including Games for Beginner Flute Players

A wide range of games suitable for beginner flute players are available in books such as:

- *The Games Teachers Play: Fun Ideas to Help Teach the Flute* (Haldane, 2001a)
- *Jewels of the Trade: An Aid for Teachers and Students of the Flute* (Haldane, 2001b)
- *Fun & Games: For Instrumental Music Lessons* (North, 2017)

Haldane’s books feature exercises on a range of aspects that are directly relevant to flute playing such as breathing, articulation, tone development and technique. Breathing games are taught using props such as a candle, where the student counts beats at M.M=60 (60 beats per minute), while blowing a stream of air towards a candle flame, without blowing it out. This exercise develops breath control, with the opportunity for the student to progress weekly towards greater endurance. (Haldane, 2001b, p.9). The book also includes short, practical flute playing exercises designed to develop and improve single, double, triple and flutter tonguing, dynamics, tone, vibrato, and rhythm. There are also practice tips, and general information on topics such as posture and positioning, exam preparation, goal-setting and management of performance anxiety. In addition to her games book, which includes activities and games for beginner students up to grade 2 level, Karen North (2017) has also recently published music card games, which assist in teaching notes, fingerings and rhythms.

Australian music teacher, Anna Lu (2009, 2010a, 2010b) has produced a series of aural and theory books designed for beginner instrumentalists aged around 6-9 years. The books introduce basic musical concepts in fun learning games, including activities using an audio CD (which includes examples played on flute) and stickers. More information about these books can be found at <https://musicbumblebees.com.au/collections/aural-theory-workbook-series>

To play flute well, flutists need to be not only technically proficient, but knowledgeable across a range of areas, as well as developing the confidence to perform in front of an audience. Each of these areas of playing can be taught from a variety of angles in lessons, for example, through demonstrations, listening to recordings, watching videos of live performances, playing together with the teacher or other students, discussing the background of the music, as well as theoretical principles and general knowledge which apply to the music being studied (e.g. form, terminology, composer's background).

Limitations

The flute tutor books reviewed in this paper focus solely on materials written in the English language, so there may be other books available in other languages which place greater emphasis on aspects such as posture, positioning, and injury prevention strategies such as providing rest breaks from playing (e.g. breaking up playing activities with non-playing activities).

This article suggests ways of incorporating non-playing, educational activities into flute lessons to enable students to take periodic breaks from the awkward playing position, which can be challenging for young beginner students. While these suggestions are consistent with recommendations in the NASM-PAMA advisory documents, these have not been tested in a formal or scientific study.

Alternating playing positions is one way to help young children to adapt to the awkward playing position, but it is also important to ensure the student is playing in a functionally efficient position, as well as with freedom of movement. Many flute players have indicated that freedom of movement while playing assists them in staying free of discomfort while playing flute (Lonsdale, 2014, p.159). General contributing factors to injury, and flute-specific issues are discussed in depth in other sources (e.g. Dawson, 2008; Fain 2009; Llobet, 2007; Lonsdale, 2011, 2014). Importantly, NASM-PAMA advises educational institutions and music educators to

- Establish a protocol for students who complain of neuromusculoskeletal or vocal pain during a rehearsal or class. For instance, you may request that they “sit on the sidelines,” remain actively engaged in the rehearsal or class, and take notes in their music. You also have the authority to excuse them from class if the situation warrants.
- If you suspect that a student is developing a neuromusculoskeletal or vocal condition or disorder (or if he or she reports a physical difficulty in playing, singing, or speaking), refer the student to the appropriate student health personnel at the institution. Your advice must not take the place of that of a licensed or certified medical or healthcare professional. Acting in this capacity exposes you to potential liability. (NASM-PAMA, 2014a, p.II-18)

Conclusion

Injury prevention strategies provided in the ergonomics, and performing arts medicine literature can be applied in the planning of lessons for beginner flute players. While scientific studies related to the flute playing position and its correlation with playing-related injuries among child flutists are limited, there are numerous studies which show that playing-related pain is common

among older flute players. Therefore, it is important to develop good playing habits as a young flutist. This article has suggested ways to incorporate non-playing activities into flute lessons for beginners, as they are learning to hold the flute correctly and learn new musical concepts. Through instilling good playing habits from the earliest stages of learning flute, teachers can assist students to sustain healthy playing lives.

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Appendix I - Rhythm Drills

Sample Rhythm Drills for Beginners

1.

2.

3.

4.

5.

Figure 1 Rhythm drills suitable for beginners

More Rhythm Drills

1.

2.

3.

4.

5.

Figure 2 More rhythm drills suitable for beginners