Violinist and Violist Music-Related Injuries: Frequency, Prevention, and Recovery Methods

Stephanie Krell

University of Nebraska at Kearney

MUS 804: Introduction to Music Research

Dr. Brian Alber

May 9, 2022

The session had just begun at the music festival I was attending to further my string education. The campus was filled with eager learners, and music wafted around the corridors as students put in their required four hours of daily practice. Within a short time, a discouraged string student was seen with an ice pack around their shoulder. Her four hours of daily study were now filled with physical therapy exercises in an effort to regain the ability to practice normally. This was one of the first occasions I became aware of music-related injuries.

Unfortunately, another time it was myself. I had come off of a sabbatical from playing after the birth of my first daughter, and was a bit overzealous in the amount of time I immediately tried practicing. The result was tendonitis in my wrist, causing me to back off playing while I pondered how to recommence training in a healthy manner.

Music-related injuries are not an uncommon experience. An Australian study from 2012 recorded that 84% of the participants from eight full-time symphonies had endured injuries or physical discomfort severe enough to impede their work as a musician. 45% of the respondents who were violinists and violists reported that they were presently experiencing these symptoms (Ackermann, Driscoll, & Kenny, 2012). This begs the question, how may violinists and violists avoid injury as they study and perform? Furthermore, what is the best method of recovery if such a hiccup in one's career occurs?

The aim of this discourse is to provide methods of safe practice and performance. Furthermore, these preventative measures ought to be part of the technical training of all violin and viola teachers and students. Should one face an injury, practical steps may be taken to carefully restart practice while allowing the body to heal, and move forward without further pain.

A variety of studies have been conducted to examine the likelihood of performance-related injuries among music students and professionals. Examined as a whole, they alert us to the fact that these struggles are encountered by this entire age range, including youth in elementary school. In fact, a 2008 study of primary and secondary school-aged children in Australia by Ranelli, Straker, & Smith provided data which documented that children were more likely to get injured at the height of accelerated growth (Manchester, 2009). Interestingly, this Australian study also found that girls had a higher prevalence of performance inhibiting music-related injuries than boys (2008). In case one might think primary school children are resilient against pain from music-making, this evidence serves as a reminder for instructors to be on the alert for students experiencing pain. It is particularly a reason for caution as a child might think that pain is part of the process of learning an instrument.

Dr. Hunter Fry studied a similar topic in Australia and Great Britain, particularly focusing on the frequency of practice among high school-aged musicians (Manchester, 2009). He found that 56% of Australian students who practiced about 10 hours every week had experienced at least one incidence of pain related to their instrument, while 71% of students in Great Britain who practiced about 20 hours every week had experienced at least one incidence of pain related to their instrument. One likely conclusion to draw from this data is that the risk of injury increases the more a student engages in practice.

Another study based in Australia surveyed performance-related musculoskeletal disorders (PRMDs) among adult musicians who are employed by professional orchestras (Ackermann, Driscoll, & Kenny, 2012). The research described such injuries as those which limit a musician from playing at their full potential. Based on that definition, most of the respondents expressed that they had suffered physical discomfort or injuries which impacted their work abilities. The number of incidences of PRMDs in string players was significant,

with 45% percent of violinists and violists having pain or injuries in some part of their body at the time of their response. It was noteworthy that where physical issues were observed seemed to be connected to the manner in which each instrument is performed (2012). For instance, the data reported that violinists and violists were the most likely candidates out of the orchestra to retain an injury in their left arm and neck. This correlates with the part of the body used to hold up an upper string instrument, and from personal experience, can be an area where unnecessary tension is retained.

Some researchers have sought to obtain data in order to direct efforts toward preventative measures. For instance, Ackermann and Adams led a study in 2004 involving violinists and seasoned physiotherapists to determine if observed motions of violinists could be assessed for injury risk (Ackermann & Adams, 2004). What in part fueled their efforts was the idea that poor technique opens up violinists to the possibility of an overuse injury. For this particular study, they made dual concurrent recordings capturing both sides of violinists playing specific musical selections. The videos were analyzed by physiotherapists for motions which could lead to injury, utilizing a predetermined assessment scale. The study found that the perceptions of the clinicians showed too much variation to yield usable determinations. The researchers concluded that the clinicians involved would have benefitted from a previous acquaintance with the mechanics of playing the violin before providing their responses. One specific example described was that some physiotherapists provided more negative feedback for violinists who were not physically fit (2004). While I imagine a toned body would certainly support one's ability to play well, one may work up the endurance to perform for extended periods of time without a slim physique to accompany. Isaac Stern, for example, did not have a slender torso for his entire professional career.

Ackermann and Adams have done additional work related to the subject of injured violinists. During the same year as the previous research, they conducted a study examining

whether injured violinists and music health experts believed that the injuries of the former were due to the same factors (Ackermann & Adams, 2004). A number of causes high on each group's list were a relative match, including sudden increases in playing time and poor posture. The study did not go as far as to establish the exact postures that would cause performance-related injuries. The results resonated with me as I spent many years unable to sit for practice or in an orchestral setting for a long period of time due to lower back pain. I believe that issues of discomfort acquired from poor posture may benefit from physical therapy. In my case, working with a therapist provided me with the ability to sit two hours for a practice session pain-free where I once was barely able to make it thirty minutes without a change of position. The exercises I was given were focused on strengthening my core, as well as stretching my back. The suggested exercises included planks, bridges, and stretches such as lower trunk rotation and press ups in the prone position.

A specific injury called craniomandibular dysfunction (CMD) was studied among violinists in Germany, referencing violin performance as a potential cause (Steinmetz, M.D., Ridder, M.D., Reichelt, M.D., 2006). The questionnaire respondents were violinists who practiced an average of 4.4 hours each day. 81% of the participants had experienced pain while playing their instrument in the past, with 39% currently experiencing pain. According to the study, the most common location for pain was the "right shoulder, cervical spine/neck, and lumbar spine" (p. 185), with 45% enduring pain in their temporomandibular joints (which connect the jawbone to the skull). Notably, the physicians were able to diagnose CMD in 74% of the study participants. They believed that the way in which the head, neck, jaw, and spine systems all work together when a violinist performs correlates with the acquisition of CMD in violin players. It was suggested that the use of oral splints appears to be a means of reducing the tension within the muscles during violin performance. This may cause the reader to envision a violinist putting in a mouth guard before a practice session or

senior recital, like a hockey player preparing for a game. In these contexts it seems a peculiar thought, as it does not appear to have made much headway into the world of strings, to date. And yet, if such a device were an effective means of combating performance pain, perhaps it should be afforded greater consideration.

Not all studies are in agreement as to the precise location of upper body injuries in violinists and violists. In contrast to the previous study, Susan Middlestadt and Martin Fishbein's research (as cited by Lautar, 2000, p. 70) showed that upper string players who get injured tend to have issues in their "left neck area and left shoulder." Violists also had the unique addition of increased issues in their left wrist versus those who played the instrument's smaller counterpart. The study indicated that out of 1,378 string player participants, approximately 69% described themselves as having significant physical injuries. In response to these troubling results, Rebecca Lautar suggests that well-selected shoulder and chin rests are of great importance as a means of injury avoidance for violinists and violists.

Furthermore, research by Marla Okner, Thomas Kernozek, and Michael Wade uncovered that repertoire directly impacts how much force is placed on the chin rest, supporting Lautar's theory (as cited by Lautar, 2000). Additionally, it was also found that one could adjust the amount of pressure exerted by selecting a different type of chin rest, such as a center versus a side-mounted. As a complement to a properly fitted chin rest, Charles Levy, Wynne Lee, Alice Branfonbrener, et. al (as cited in Lautar, 2000) also observed that using shoulder rests contributed to lower muscle tension in the shoulders and neck. Lautar suggests that those of great stature may benefit from a "custom chin rest" (p. 71), though this is not yet supported by research. She expands her theory, based on anecdotal evidence, by expressing that such builds are better able to keep the instrument correctly placed by having a higher chin rest than a shoulder pad with long feet.

When students come into my own studio, they often possess violins with side-mounted chin rests. I have found this to be problematic for those who struggle to get their left hand around the neck of the instrument. This can lead to strain in the left shoulder, which sometimes reverberates down the same arm. Instead of pushing these students to "reach harder," I often point them toward a center-mount Ohrenform model chin rest, which happens to be available in various heights. Other options for this chin rest placement are the Flesch or Wittner center-mount models. It is wise to try these out first as they each have slightly different curves, and each student's uniquely-shaped jaw will contact them differently. I also work with the student to achieve the ideal height of their shoulder rest in order to prevent the body from exerting much effort in supporting the instrument. This generally involves adjusting the legs on either side of the rest to properly contact their shoulder, as well as the angle of placement on the instrument.

Another helpful suggestion Lautar makes is for students and teachers to consider the seating which they use, both for performance and practice. So much time is spent in a seated position during these endeavors, which can contribute to physical challenges. She advises teachers to assist their students in finding chairs which are both comfortable and safe to sit in for extended periods of time (Lautar, 2000). Naomi Lisowski notes that most seating for day-to-day use is made for one to sit back, rather than in an upright posture (Lisowski, 2021). She maintains that the most important things to examine in a proper chair are its "height," "tilt," and "cushion" (Lisowski, 2021, par. 7, 8, & 9). A chair needs to place one's hips barely higher than the knees, and keep the musician at a slightly forward tilt. This will ensure good circulation, and avoid forcing one into an unhealthy lower back posture. As far as cushioning, one might think that more is better. Instead, there must be a balance as too much would also challenge the use of proper posture. She particularly suggests the Wenger Musician Chair for all types of instrumentalists. A portable option she mentions is the Adjustrite Musician's

Chair, which is possible to fold up and transport. Due to convenience, she personally opts for a simpler way to ensure a comfortable rehearsal seat (as it can be a challenge to carry around additional equipment) by employing a chair pad such as the Tush Cush. Lisowski also includes the unusual idea of a stability ball filled with sand for practicing purposes, which has the added bonus of aiding in the development of core muscles. I particularly liked the idea of the travel seat and cushion as I have arrived at various rehearsals and noted well-spaced metal folding chairs with dread. I would not be surprised if this was a major factor that contributed to the pain I felt at the end of these endeavors. Numbness was also a common side effect of this type of seating.

Others have explored preparatory stretches as a means of reducing a musician's perceived level of pain after practicing or performing. Cooper, Frost, & Hahmann (2012) conducted one such study in a junior and high school orchestral setting with students of comparable playing levels between the ages of 15 and 18. Prior to rehearsing, students were instructed to complete a survey as to pain levels in five parts of their bodies. They were not permitted to view these answers post-rehearsal when they filled out the same survey. This was used both in the control group of students, as well as in a group which participated in various upper body stretches throughout rehearsal. It demonstrated that the latter students perceived a lower amount of pain, post-practice, while those in the control group noted more pain after rehearsal.

One of the major inspirations which fueled this study was the question as to whether lasting bodily harm may be the end result of a growing child continuing to play their instrument while in pain (Cooper, Frost, & Hahmann, 2012). While the study only discussed the perception of pain rather than actual injuries, it is worth noting that the study seemed to indicate that this concern within music performance and practice could be addressed through specific stretches. The researchers advised teachers to be diligent in teaching students how to

avoid injury, noting that a survey by the Medical Problems of Performing Artists (MPAA) (as cited in Cooper, Frost, & Hahmann, 2012) revealed that very limited time is dedicated to such matters within the private music instruction setting. They also emphasized the importance of providing an atmosphere within private lessons conducive to students feeling able to freely disclose pain, facilitating coaching for its avoidance.

There are times that musicians end up injured despite precautions taken to stretch, and participating in physical strengthening exercises. It is in these situations that the task at hand is the challenge of recuperation. Violinist and conductor Kellie Dubel Brown recounted her experience of working from not being able to perform to continuing her professional work in *American String Teacher* (2012). She particularly recounts the practice system she developed for use while rehabilitating her right shoulder. Brown believes the system she outlines can be a tool, both for the means of injury prevention, and to forward the process of being able to play again. As such, she also makes use of these concepts during her normal practice schedule.

The first aspect of study that can be utilized during rehabilitation is intentionally listening to a work being studied. The goal is to take time to formulate a practice plan and establish one's desired "musical interpretation" (Brown, 2012, p. 78). One could explore various performances of the same piece, also aiding the understanding of the work as a whole. This process can be greatly aided by examining the score to consider fingerings, confirm rhythms, after which a "gentle warm up" (p.78) between five and ten minutes can be attempted on the instrument.

One unique practice technique she suggests is based on the work of violinist Kató Havas, who encouraged musicians to sing the work they are studying, while allowing the body to move along with the sound of the notes. Havas' original intention was to utilize the

internalization of music as a means of working through performance fears, but Brown explains that this can also be useful for those who are seeking to learn music without the ability to use their instrument for extended periods of time. As a next step, Brown suggests that the string player pretend to play the selected piece without the instrument, being very careful to avoid movements that would cause further pain in injured areas.

Also on the subject of limited time to play the instrument, Brown suggests breaking down one's study into the parts of a piece that might need the most attention, while avoiding unnecessary areas such as those already learned or those which show up again later in the work. This can be very helpful for using one's time effectively as there never seems to be enough hours to cover the material which must be addressed in the practice room. In addition, one can still set and reach goals for sessions which must be brief due to an underlying condition.

Brown mentions that her studies with William Starr shaped her knowledge of practicing efficiently. Starr taught his students to limit themselves to focus on a small section for 30 seconds, which he felt was the maximum amount one could work on a section effectively. After a section has its time exhausted, one continues on to the next section to be addressed. Brown considers this method as among the "most important lessons" she gained from his tutelage (Brown, 2012, p. 79). She also strongly suggests adhering to a timer in order to avoid playing a passage longer than one is able to fully absorb mentally. Brown says this can be useful both when one is able to use their instrument, as well as when one is limited in that regard.

It can be very disconcerting to confine one's practice to short segments of time, especially when the desire is to be playing at full strength. One must consider that overdoing it during the rehabilitation process may lengthen the time it takes to achieve this goal, perhaps

making it impossible if the injury is exacerbated. Cora Cooper encourages injured violinists to utilize the advice of Janet Horvarth in *Playing Less Hurt* by beginning this process with five well-planned minutes of practice (Cooper, 2007). The violinist may next add more sessions five minutes in length, followed by slowly adding minutes to these sessions "over a period of weeks" (p. 52). These instructions communicate the expectation that getting to one's previous practice time will be a gradual progression, and must not be rushed. Cooper suggests documenting the length and content of practice, and the body's response to it as a resource for the rehabilitation process. She also advocates for short three-minute practice segments which focus on various string techniques.

Beyond limiting one's practice time to proper lengths, Cooper goes on to provide a safe approach to reacquiring technique by dividing up technical studies in levels one through five. These include materials to strengthen both sides of the body, whether it be exercises for the left side involving shifting and double stops, or the various bow strokes articulated by the right side. Cooper cautions that one must not move to a higher level before the body is ready. As far as specific repertoire, the author advocates the avoidance of Romantic music earlier on in the process, and rather to focus on Baroque music which has been shown to be less physically demanding. Some ideas she offers are sonatas by Handel, Corelli, as well as those by Mozart from his earlier years of composition. Cooper also points the reader toward the ASTA *String Syllabus* as a resource for further ideas on works at less demanding levels.

Many violinists and violists who make music their profession face injuries at some point in their career. This should encourage the upper string player to be proactive about the avoidance of injury through the use of proper technique, stretching, and finding chin and shoulder rests which are best suited to their build. Oral splints may also be a consideration for those experiencing or looking to avoid CMD. Instructors should promote these ideas in their teaching, and promoting an atmosphere where students may readily admit if something hurts

in order to better address their needs. In the unfortunate context in which a violinist or violinist is seeking to recover from an injury, one must take carefully selected steps towards reacquiring technique and gradually pursue increased practice. In doing so, one may learn how to make thoughtful use of short practice segments, and have the opportunity to explore alternate means of practicing, which will also prove useful during normal circumstances.

References

Ackermann, B., Driscoll, T., & Kenny, D. T. (2012). Musculoskeletal pain and injury in professional orchestral musicians in Australia. *Medical problems of performing artists*, *27*(4), 181–187. https://pubmed.ncbi.nlm.nih.gov/23247873/

Ackermann, B. J., & Adams, R. D. (2004). Perceptions of Causes of Performance-Related Injuries by Music Health Experts and Injured Violinists. *Perceptual and Motor Skills, 99*(2), 669–678. https://doi-org.unk.idm.oclc.org/10.2466/pms.99.2.669-678

Brown, K. D. (2012). Studio Tips. *American String Teacher, 62*(4), 78–79. https://doi.org/10.1177/000313131206200416

Cooper, C. (2007). The "Comeback Plan" for Injured Violinists. *American String Teacher, 57*(4), 52–55. https://doi.org/10.1177/000313130705700407

Cooper, S. C., Hamann, D. L., & Frost, R. (2012). The Effects of Stretching Exercises During Rehearsals on String Students' Self-Reported Perceptions of Discomfort. *Update: Applications of Research in Music Education, 30*(2), 71–76. https://doi.org/10.1177/8755123312438720

Cooper, S. C., Hamann, D. L., & Frost, R. (2012). The Effects of Stretching Exercises During Rehearsals on String Students' Self-Reported Perceptions of Discomfort. *Update: Applications of Research in Music Education, 30*(2), 71–76. https://doi.org/10.1177/8755123312438720

Lautar. (2000). Are Shoulder Rests the Secret to Performance Longevity? *American String Teacher*, 50(2), 70–73. https://unk.primo.exlibrisgroup.com/permalink/01UON_K/oggosn/cdi_proquest_journals_964790

Lisowski, N. (2021, March 3). *How to Find the Best Ergonomic Chairs for Musicians*. PTProgress | Career Development, Education, Health. Retrieved March 27, 2022, from https://www.ptprogress.com/musician-chair/

Manchester, R. A. (2009). Looking at musicians' health through the "ages." *Medical Problems of Performing Artists*, *24*(2), 55+. https://link.gale.com/apps/doc/A211707076/AONE?u=unl_kearney&sid=bookmark-AONE&xid=db345c85

Ranelli, S., Straker, L., & Smith, A. (2008). Prevalence of playing-related musculoskeletal symptoms and disorders in children learning instrumental music. *Medical Problems of Performing Artists*, *23*(4), 178+. https://link.gale.com/apps/doc/A197797339/AONE?u=unl_kearney&sid=bookmark-AONE&xid=a2a63657

Steinmetz, A., Ridder, P. H., & Reichelt, A. (2006). Craniomandibular dysfunction and violin playing: prevalence and the influence of oral splints on head and neck muscles in violinists. *Medical Problems of Performing Artists*, *21*(4), 183+. https://link.gale.com/apps/doc/A173746641/AONE?u=unl_kearney&sid=bookmark-AONE&xid=bcefd0b7