Give Your Students Security and Comfort:
custom-fit their shoulder-pads and chinrests
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Have you ever thought, "Holding a violin/viola shouldn't be so complicated. There must be a better way to do this!" You are in good company, especially if you have had this thought while watching one of your students. I feel that the key to resolving this issue lies in custom-fitting a shoulder-pad and chinrest to fit the unique shape of each student's body. Below, you will find detailed guidelines for how to do this. But first, let me outline how I developed my ergonomic approach to instrument set-up.

I've always had a long neck—the kind of neck that a ballerina would envy. But as a violinist, I remember only too vividly the problems it caused me during my teen years. I practiced many hours a day, and had frequent pains in my neck, shoulders, and upper back. My violin never quite felt comfortable or secure, and over the years I tried numerous chinrests and shoulder pads, adding various foams and cloths in search of comfort. Unfortunately, each "solution" was short-lived; having relieved pain in one area, I'd only end up with a new ache somewhere else. Excessive muscular effort pervaded my playing, largely because of the gripping action and neck contortion needed to keep my violin in place.

Only after I entered college and began studying kinesiology (ie. anatomy, physiology, bio-mechanics, movement analysis) did I have the analytical tools needed for developing a set-up that was "ergonomically" based. My large violin hickey disappeared, my chronically tense neck and shoulder muscles softened and returned to their normal state, and I was able to develop a tension-free technique. My set-up has withstood the test of time—I've used the same custom carved chinrest and custom bent shoulder pad for fifteen years now. During this time, I've also created custom set-ups for students and professional colleagues; the same principles have worked well across the board.

Having gone through years of pain and experimentation to come up with a logical and body-based approach to instrument set-up, I can only urge teachers to give the matter considerable thought. I must admit that while my students have always gotten customized set-ups, only the past three years of teaching my son have shown me the true complexity of setting up a very young child. Previously, I had been content to use sponges or mini-Kuns—although I was never completely satisfied with the results. But watching my son's learning process unfold on a day-to-day basis, and finding myself correcting his violin position countless times each day really got me to thinking and analyzing.

So, when he was three, I made his first custom shoulder pad and built up a cork/molefoam chinrest, both based on the principles outlined below. (Details of construction are described later on in this article.) I went through several test models before coming up with a satisfactory design. When he turned five, I was able to use the information from these models to customize the shoulder-pad and chinrest that he's been using for the past two years. The gratifying result is that he's built a tension-free, balanced violin position without my having to say much of anything about it. His set-up hasn't really allowed him any choice but to put the violin in the "right place"—something that I'm convinced every beginner should benefit from!

The Basic Principles

1. ***Violin close to body, relieving deltoids of extra work:*** rest the instrument on the collarbone and fill in the gap between shoulder and violin with a custom-shaped pad. This keeps the left arm in its lowest possible position. In contrast, shoulder-pads that "jack up" the instrument put the player's left hand at a higher plane; the deltoid muscle ends up working harder simply to maintain the instrument's position, and the bow arm has to compensate for the higher instrument level as well.

2. ***Minimal muscle work to keep instrument in place:*** create a shoulder pad that "hooks" somewhat over the back of the trapezius muscle. This keeps the instrument from sliding forward, and relieves the player of the need to "grip" the violin between jaw and shoulder. In addition, custom-contouring the pad allows the weight of the instrument to be evenly distributed so that no muscles or nerves become irritated.

3. ***Minimal rotation of head and neck with evenly distributed pressure on chin and jaw:*** use an over-the-tailpiece or center chin-rest and file/sand away any areas that cause pressure on the jaw bone. This helps prevent TMJ problems and can eliminate "violin hickeys".

4. ***No tilting and minimal "nodding down" of head:*** the instrument should fill in the entire distance between collarbone and jaw. For example, while a full-size violin is little more than an inch deep, the average distance from an adult's collarbone to chin is between 3-5 inches. Build up the chinrest to fill in this space (likewise in children and teens) and maintain the integrity of alignment between spine and skull. This helps eliminate muscle imbalances and pinched nerves.

Materials To Have On Hand

****Shoulder pad*** with maximum adjustability options and made of a material that can be bent into shape. (Thus far, I've been able to use the Willy Wolf Secondo model for all my fittings, ranging from the smallest available for 16^{th} –8^{th} size, through the full size version. The very smallest size is not commonly available, you may have to special order it through your local dealer.)

****Chinrests*** (over-the-tailpiece and center-cup models), violin & viola spindles, sandpaper (rough to fine), rounded files

* ***Cork*** (from wine bottles is a cheap and easy source)

* ***Molefoam*** and moleskin, thread and needle

****Wire*** (coat hanger or similar gage), pliers, masking tape

****Modeling clay*** and saran wrap

Creating a Custom Set-Up

Start by fitting the shoulder pad, and then build up the chinrest as needed. As you work, give the student ample opportunity to actually play the instrument and test out the set-up. Important to keep in mind is that sometimes a change may feel awkward because it counters an ingrained, negative habit. Muscles need sufficient time in adjusting to a new movement pattern, and the player may need coaching on how to release tension in habitually contracted muscles. This calls for an increased level of body awareness, combined with an accurate mental conception of how the muscles, bones, and joints look and work.[1] Creative images geared towards improving posture and movement quality can support the process as well.[2]

Customizing a Shoulder Pad:
Begin with the student in a neutral, balanced posture; you will be holding and placing the instrument. Lay the instrument onto the collarbone, with the tailpiece pointing into the neck so that when the head is turned left approximately 20-30 degrees , the chin will be centered over the tailpiece (see fig. 1). This placement allows the weight of your head and instrument to be anchored on the bony "shelf" provided by your collarbone, leaving the surrounding muscles free to move.

Now consider these three components: 1) direction of the scroll (whether the violin is aimed more to the front or farther out to the left) 2) height of the scroll (how horizontal do you want the finger board to be?) 3) how flat or tilted do you want the violin to be? Also take into account the length of the student's arms and how this affects the instrument/bow relationship. Find a happy medium between all these aspects where arms, hands, and fingers can work in a balanced manner. (A discussion of these aspects lies outside the scope of this article.)

Ask the student to raise his/her left hand into playing position (without any shrugging of shoulders!) while you continue to hold the instrument in place. The remaining space between instrument and shoulder needs to be filled. The shoulder-pad's curve must precisely conform to the player's shoulder and upper ribcage so that the instrument's weight is evenly distributed. The pad also should be placed relatively close to the player's neck, arcing over the collarbone and contacting the upper ribs in front, rather than resting farther out on the muscles of the shoulder and chest. Again, this takes advantage of "bony support", frees the muscles to move, and maintains circulation.

When the instrument is positioned with the tailpiece centered over the collarbone, its G-string side curves back over the trapezius. This is advantageous, because then the shoulder-pad also extends back over the trapezius, which allows you to build in some extra security. Bend the end of the shoulder-pad into a "hook" (fig. 2) which follows the contour of the trapezius back towards the shoulder blade. When you let go of the pad, it will stay in place of its own accord rather than slipping or falling down. (Bend it over the edge of a table or chair, and distribute the bend over a couple of inches—no sharp angles please!)

Next, twist the pad around its longitudinal axis until the entire surface contacts the player's body evenly (see fig. 3 for direction of twist). Yes, it's hard work to do this—you are bending the metal plate that the cushy foam is attached to. But, once you have the desired contour, it will not lose its shape. If necessary, use mole skin/foam to even out any gaps. Finally, adjust the leg-screws on both sides to fill in the space between shoulder and instrument as needed. You will probably need to bend the leg on the G-string side inward considerably to make up for the "hook" that you have created. You may also need to cut off the protruding end of wire on the E-string side to avoid damage to your instrument.

A Shoulder-Pad for Very Young Children

Here is an option for very young beginners (I did this when my son was just starting at age three). The tiny Willy Wolf Secondo doesn't have all the options for adjusting leg height, tilting the plate, etc. that the next size up has. Nevertheless, start by bending it as nearly into shape as you can manage. Next, hand-make a separate shoulder-pad out of coat hanger wire which perfectly fits the child's shoulder, and cover this frame with molefoam. Then, using rubber bands, attach this pad to the Wolf pad, and adjust the angle with a wedge of mole foam between the two (fig. 4). Again, make sure that there is full contact between the entire breadth of the pad and the child's body. When the student graduates to the next size shoulder-pad, you can bend and twist it just as described earlier; just remember to lessen the bend as the child grows.

Customizing a Chinrest

Having finished the shoulder pad, it's time to customize the chinrest. You can find quite a few over-the-tailpiece models, but there are only a few designs available with a centered cup (the most common are two "Flesh" models, one with and the other without a hump over the center). If the student's neck is long enough to require quite a bit of extra height on the chinrest, a center-cup model is usually most comfortable because the chin isn't left unsupported in mid-air. Thus far, I've had the most success with the "humped" one. The design reduces pressure on the jawbone where it crosses the edge of the chinrest, and the hump keeps the violin from slipping outward away from the chin. If the hump is too large, it can be sanded away until it's comfortable. I find this preferable to building up a "hump" or "ridge" with mole foam.

Keep in mind that any shaping of the chinrest's top surface takes place *after* it has been secured at the appropriate height and angle. The goal is to maintain a balanced alignment of head and spine, so that only the weight of the head really keeps the violin in place. Hold the instrument in place on the collarbone (with the customized shoulder-pad on) and have the student pivot his/her head to the left about 20-30 degrees (refer back to fig. 1). Any more than that causes unnecessary muscle-work. Quite often, teachers ask their students to look about 45 degrees to the left, perhaps lining up the nose with the tailpiece. But, the student can watch fingers and bow even without this much rotation. Furthermore, once a student reaches Bk. I Perpetual Motion, he/she should no longer be dependent on looking. Rather, the focus should shift to developing kinesthetic memory, to playing "by ear and by feel". (Emphasizing visual input tends to somewhat block awareness of the other senses; furthermore, the eyes will be needed for looking at printed music soon enough!)

Make sure that the head is not tilted (the eyes stay level) and then have the student "nod" down about 1 cm. (no, that's not very much). The remaining space between chin and chinrest needs to be filled in such a way that the contact is evenly distributed and the weight of the head is balanced and centered. Depending on the individual's jaw and chin shape, the chin-rest may need to be raised on one side or the other (more often on the E-string side) to create evenly distributed contact. In addition, the entire chinrest may need to be raised. Have a supply of wine corks on hand, plus a sharp knife and cutting board. You can cut cork wedges to fit in between violin and chinrest, shaping and adjusting the wedges until you achieve a perfect fit. (Keep in mind that a thick layer of cork can dampen the instrument's resonance; consider having a luthier replace the cork with wooden wedges glued to the chinrest.) Finally, using a rounded file and/or sand-paper, make any necessary adjustments to the top surface and edges of the chinrest. The most important place for adjustment is where the jawbone crosses the chinrest's edge (fig. 5).

Custom-Carved Chinrests
Sometimes (as was the case with me), the necessary changes in set-up are so dramatic that the violinist's (violist's) entire technique needs adjustment. As upper body, neck, and head come into alignment, the player's perception of comfort and balance will shift, sometimes over the course of weeks or even months. In this case, create a temporary chinrest that can be altered to accommodate changes in technique.

Begin by adjusting a chin-rest as indicated above, making it fit as well as possible. Then, use modeling-clay (which stays quite firm, retains the shape you give it, and is available at most art stores) to build up whatever hump or ridge is necessary for comfort. C
over the clay with a piece of Saran Wrap secured by a rubber-band. The modeling clay can be re-shaped at any time, you can add or take away clay until you come up with your "final model". Finally, a luthier can custom-carve a brand-new chinrest based on your model. However, ask him/her to leave it unfinished so that you can take a couple of week to make any last adjustments (with file and sandpaper) before having it lacquered.

On a cautionary note: a modeling-clay chinrest can dampen the sound of an instrument considerably. Also, the student may have trouble fitting it in his/her case without squashing the clay. So choose a time when these issues will have the least impact on playing activities.

Chinrests for Young Children
Even the youngest beginner can have a center-cup chinrest, but you will need to custom-build it (they are not available in child sizes). Start with a "Guarneri"-style child's chin-rest, which extends over the tailpiece. Using cork, cut out a platform for the E-string side of the tailpiece. Use moleskin to secure the cork to tailpiece and chinrest, fill in any gaps with molefoam, and then build up the appropriate contours on top using graduated layers of molefoam (see fig. 6). Smoothly cover the finished chinrest with a layer of moleskin. As the child grows, remember to keep adding layers as needed.

Once the child is using an 1/8th size violin, an adult center-chinrest becomes an option. Surprised? I was too. But, a few years ago it struck me how large a child's head really is *in proportion to the rest of his/her body*. Given this, fractional violins are properly proportioned for short arms and little bodies, but the tiny child-sized chinrests may be too small for many children's heads! As long as a child's neck is sufficiently

tall, a full-size chinrest can provide fabulous stability and comfort (as I discovered when I provided one for my five-year-old son to use).

The main difficulty involves the hardware: you'll need to drill and thread a new set of holes in the chinrest to accommodate the hardware that comes with a child-size chinrest. Full-size hardware will not screw down far enough to fit anything smaller than a ½ size violin (unless the child's neck is tall enough to allow for cork wedges between instrument and chinrest). Aside from this, all other adjustments are made as described earlier. Do add a covering of molefoam over the metal clamp where it will contact the collarbone. If needed, you can also cover up the spindles and the button that secures the tailpiece—a child can only "cuddle" the violin into his/her body if all sources of discomfort are eliminated. And remember to adjust the chinrest's height (with thin slices of cork) as the child grows.

Endnotes:

[1] Freymuth, Malva. 1999. *Mental Practice and Imagery for Musicians: a practical guide for optimizing practice time, enhancing performance, and preventing injury*. Boulder, CO: Integrated Musician's Press. 43.

[2] Ibid. 44-47.