

# Music, Movements, and Monitoring

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*With this article, Helga Winold begins her two-year tenure as editor of this forum. Dr. Winold is professor of music (cello) at Indiana University School of Music.*

Cello performance or practice usually begins with a conception of the *music*, which is realized with *movements* of the muscles and then controlled by *monitoring* the resulting sounds, sights, and physical sensations. In cello performance, monitoring is usually not consciously emphasized or it could interfere with the flow of the music. In practice sessions, however, it may be helpful to emphasize monitoring to achieve greater effectiveness and efficiency and especially to avoid developing improper playing habits.

In this article, I suggest ways that monitoring may be made more effective and efficient by surveying the basic physical movements of cello playing and providing a checklist of important points to be observed with each movement. In general, I avoid specific instructions on exactly how these movements should be executed. Individual players and teachers with varying physical makeups and varying musical intentions will naturally differ on the details of these movements. Instead, I have tried to suggest general principles of movement and monitoring that are common to most, if not all, of the various schools of playing.

## Preliminary Factors

I assume you observe the following preliminary factors:

- You sit comfortably on a chair that is the proper height for you and hold the cello in appropriate relationship to your body.

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- You breathe properly.
- Your head, body, and limbs are in a flexible state of equilibrium.

You should monitor these preliminary factors as carefully as your movements. Indeed, in many instances, difficulties with movements may be traced to problems in one of these preliminary factors and may be corrected by making changes in the factor.

In the following sections, I describe the basic function of the arms and their moving joints: shoulder, elbow, wrist, and knuckles.

## The Joints of the Right Arm

The muscles of the back and those surrounding the shoulder joint move the arm from the shoulder joint for three main movements:

1. *Sideways pendulum swings*  
Lift the upper arm and slightly pronate it (that is, turn it inwards to the left). Swing the arm back towards the

body like a pendulum and then out again. At the lower half of the bow, you can easily execute longer or shorter strokes both on and off one string.

2. *Clockwise circles*

For string crossings in the lower half of the bow, initiate circles with the upper arm from the shoulder joint. Start with downbow on the upper string.

3. *Counterclockwise circles*

Start with downbow on the lower string.

The muscles of the upper arm move the lower arm from the elbow joint for three main movements:

1. *Sideways pendulum swings*

Hang the forearm from the suspended upper arm. Stretch the forearm, slightly pronated under the elbow, so it can swing back towards the middle of the bow. We use this pendulum movement for faster strokes because the mass of the forearm is smaller than the mass of the whole arm. With very fast strokes, the wrist will become looser and allow the hand to swing and produce a *sautillé* stroke.

2. *Clockwise circles*

For crossing strings at the upper half of the bow, initiate circles of the forearm around the elbow. Start with downbow on the upper string. Once set in motion, the circles will almost continue by themselves. The upper arm will move out of phase, that is, the *upper* part of the small circle produced by the upper arm will coincide with the *lower* part of the circle produced by the forearm, unless the elbow joint is stiffened.

3. *Counterclockwise circles*

Start with downbow on the lower string.

The muscles of the forearm move the hand from the wrist joint for sideways

and circular movements.

1. *Slower, controlled strokes*

The wrist movement consists of a very slight bend at the frog and a straightening towards the tip to adjust the transfer of weight from the arm to the fingers. This also serves to keep the bow straight.

2. *Faster, ballistic strokes*

For sautillé or spiccato bowings at the middle and upper half of the bow, the wrist loosens and allows the hand to swing sideways on one string or in circular movements for string crossings.

The muscles of the forearm move the fingers in two directions: up and down for fast string changes on adjacent strings and sideways for bow changes.

### The Joints of the Left Arm

We use the same joints with the left arm and hand as we do with the right arm and hand, but in different manners to achieve different goals.

The shoulder and back muscles move the upper arm into different playing positions. The up-and-down and circular movements of the elbow from the shoulder serve at least four functions:

1. They position the left hand for each of the four strings.

2. They bring the arm around the cello for the higher positions.
3. They give the impulse for shifts in the shoulder joint. The elbow is set in motion before the shift takes place and anticipates the opening of the forearm.
4. They rotate the upper arm in the lower positions to create vibrato. The forearm and upper arm form a double-lever (see-saw or teeter-totter) movement.

The muscles of the upper arm extend and retract the forearm at the elbow joint. We use this movement for shifting from one position to another. We use a fast extension and contraction in the elbow joint and a slight rotation of the forearm for vibrato in the "three-finger" and thumb positions. The wrist moves only slightly. The elbow-wrist-knuckle connections form practically a straight line. Often, we bend the wrist a little for the three-finger positions and gradually bend it inward for the high positions as we move the hand toward the bridge.

The muscles of the forearm produce hammerlike up-and-down movements of the fingers. These movements are obviously the all-important ones of stopping the string to produce different pitches. The hand and finger muscles spread, stretch, and bend the finger joints

and allow the vibrato movement to continue into the fingertips.

### Checkpoints for Monitoring Movements

You should be able to solve most problems involving movements by reducing them to those necessary for moving the joints. Awkwardness that might disturb your music making may come from any of the following problems:

- body balance,
- head and neck mobility,
- stiffening the joints,
- using the wrong part of the arm,
- not taking advantage of the momentum of a motion,
- excessive motion,
- inaccurate motion,
- insufficient strength,
- excessive pressure, and
- inefficient transfer of arm weight.

These checkpoints apply to both hands, but in slightly different manners. If the right arm swings in circles freely from the shoulder, the forearm swings in circles around the elbow, and the wrist, hand, and fingers flexibly conduct the movement impulse into the bow, then we will be able to play extensively without getting tired or hurt. If the left shoulder rotates and moves freely, the forearm extends and contracts easily, and the

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fingers are flexible and strong to support and transfer the arm weight, then we will be able to play fast, shift accurately, and have a continuous vibrato without unduly taxing our strength.

It is also true that problems in one arm may produce problems in the other. For example, jerky or stiff movements of the left arm may result in a bad bow stroke and poor sound quality; stiffness in the joints of the right arm may prevent well-timed shifts or cause a tight vibrato.

When we turn from practice of single movements to practice of musical passages or performance, some additional factors may produce problems in executing movements. These include:

- incomplete formation of the musical concept,
- ineffective transfer from the mind to the body, and
- incorrect perception of the sounds produced.

### Aids to Monitoring Movements

Most of the time in our practice, we monitor our movements simply by looking at the movements and trying to assess their accuracy and appropriateness. We can improve or augment simple visual monitoring by several techniques.

#### Simple Visual Monitoring

One technique is to perform the movements first without the instrument, then with the instrument but without making any sound, then with sound. For example, practice upper arm pendulum movements first simply by executing the right-arm movements without the bow. Then do the same movements with the bow, but without the cello. Finally, do the same movements with bow and cello. When you do this, you should force yourself at first to concentrate on the movement, not the sound.

A second technique is to perform the movements at various speeds ranging from very slow to very fast. In doing this, however, you should be aware that you are really practicing different movements when the changes of tempo are large enough. My research with computerized analysis of bowing movements has shown in a very convincing manner that practicing movements in different tempi is not just a quantitative but also a qualitative difference.

#### Monitoring Physical Sensations

Instead of looking at our movements, it is sometimes helpful to close our eyes and just focus on the physical, or kinesthetic, sensation or "feel" of the move-

ments. We can even carry this one step further and simply imagine how a movement would feel or look, without actually doing it.

#### Mirrors

Mirrors allow us a somewhat different view of our movements than we could achieve simply by looking at them. We must remember, however, that we are seeing a reverse image. We must also keep in mind that the very act of looking in the mirror is taking some of our attention away from the movement itself.

#### Camcorders

The problems connected with the use of mirrors are largely overcome with the use of the video camcorder. For many years, the prohibitive cost, cumbersome size, and technical difficulties of this equipment made it impractical for use in the teaching studio or practice room. Now, cheaper, smaller, more "user-friendly" camcorders are available, and this method of monitoring movements is becoming more widespread. It certainly offers us the most complete and objective method of monitoring our movements, and I can testify to some remarkable breakthroughs with my students through the use of this technology. In addition to monitoring their movements, students also have the opportunity to see what their stage presence is like. Often, students will correct bad habits simply by becoming aware of them through a video recording.

Could the use of a camcorder usurp the role of the teacher as the principal monitor of a student's progress? Hardly, for nothing can replace the instantaneous judgment of a combined aural-visual real-time performance as viewed by an experienced, knowledgeable, and concerned teacher. Yet for those hours and hours of practice time without the teacher, the camcorder could become an extremely effective surrogate. Furthermore, we can view the video together with our students, discuss positive and negative aspects of their performance, and refine their and our ability to observe and analyze cello playing. Along with the development of this technique, the students will gain faith in their own ability to think as they practice, perform, and teach.

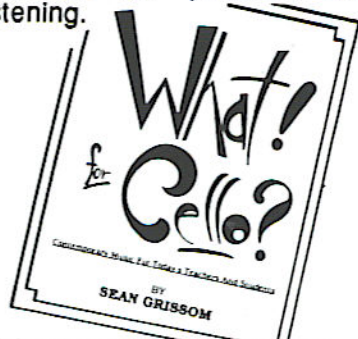
#### Conclusion

I began this article by pointing out that a musical conception is the starting point for any musical experience, including cello performance or practice. I have

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simply chosen in this article to emphasize the role of monitoring. This was partly because of the difficulty that sometimes comes in reaching a consensus on questions of musical interpretation. More important, this emphasis on monitoring was the result of watching students as they developed through the years. Those who develop effective monitoring methods, whether through conscious applications of principles or simply through fortunate intuition, are those who usually make the fastest progress and learn to be more independent.

The emphasis on monitoring of physical movement and the use of camcorders or other technological assistance can help but never replace effective teachers. That is why most of us, even if we have been playing and teaching for many years, need to get inspiration from other teachers or from workshops or from simply getting together with colleagues for an evening of sharing demonstrations, problems, and solutions. Yet it is still true that we and our students can probably learn to be more effective monitors than we presently are. And as we become more effective monitors, we become more effective performers and teachers. ✍