
BASICS

Warming down

In all physically demanding disciplines, from sport to dance, much attention is always given to warming down, and specific warm-down routines are always an important part of training. It is curious that string teaching has not kept up with all of this widely-available knowledge of how best to treat your body. While most string players know all about warming up, few ever find out about warming down until they run into trouble.

An introduction to lactic acid

What exactly is going on when you get aching, tired muscles after playing for many hours? In *Running your best*, marathon runner Ron Daws explains:

Endurance is associated with aerobic metabolism. At relatively slow speeds a runner can absorb, transport, and utilize enough oxygen in the muscles to economically split the chemical which is the source of our energy – adenosine triphosphate, abbreviated to ATP.

The ATP stored in the working muscles is limited to only a few second's work, but fortunately creatine phosphate (CP) is also there for rebuilding ATP. But CP is also limited and runs out after about 15 to 20 seconds of heavy exercise. So how are milers able to race for four minutes and marathoners for over two hours? Enter aerobics and anaerobics.

If the rate of work is moderate, as in a marathon, a runner can get enough oxygen to economically burn fat and glycogen. This enables ATP to be rebuilt as fast as it is being broken down, and a trained runner can continue for several hours at least. This is *aerobic* metabolism.

If the rate of work is very rapid, as in the sprints, oxygen cannot be absorbed fast enough for the breakdown of fat and glycogen. The body is able to cheat chemically for a short while and breaks down glycogen *without* oxygen. This is *anaerobic* metabolism. Unlike aerobic metabolism, with its innocent waste products of water and carbon dioxide, the nasty waste product of anaerobic work is lactic acid which, as it accumulates, ultimately prevents the muscles from contracting.

A by-product of the presence of lactic acid is greater acidity in the blood, and it is this that causes the soreness and sensitivity. There are of course other reasons for aches and pains, but while these may crop up from time to time, muscle maintenance is an issue that never goes away. Clearly we cannot enjoy beautifully light, springy muscles if they are all clogged up with deposits of lactic acid.

It goes without saying, that the important thing is to find how to play with so little effort or tension that you reduce the chance of the muscles not being able to 'breathe' in the first place. This is a matter of technique, but it is also a question of physical type. Some people simply do not know what it is to feel sore after hours of heavy playing, even without being a 'top' player; they may get tired, perhaps, but not sore. Others start to ache after a short period of playing, even when there is nothing apparently wrong with how they are playing.

The question is, how to get rid of those nasty waste products if they do accumulate, and the answer lies simply in warming down.

Warming down

When string players are faced with long hours of heavy practice, or arduous orchestral or recording schedules, they need to do as sportsmen do. When hockey or tennis players go off court after a strenuous match, they do not simply flop into a chair and relax. First they make sure they warm down. If they did not do this, when they woke up the next morning their muscles would feel sore and stiff.

If they stop immediately, the circulation and respiration drop down too quickly for the removal of the waste products from the body. What they have to do is keep the blood flowing in order to wash away deposits of lactic acid, but without producing more in the process.

So for 15 or 20 minutes they gently jog, or alternate hot and cold showers, lie in an ice-bath, have deep-tissue massage, jump up and down and shake themselves about, and so on.

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Massage

Deep massage is a very good way to eliminate chronic build-ups of lactic acid by increasing circulation and flushing waste products from the muscles. You can briefly massage most areas of your arms and upper shoulders yourself, and do this at regular intervals throughout long practice sessions. It is not difficult to learn the basic techniques, and any massage is better than none.

The important places to massage in the shoulder area are obvious, but the place violinists must go for most regularly are the muscles in the upper forearm. Wrap the fingers of the right hand around the left forearm (Fig. 1); make fingering movements with your left hand, and feel where the muscles are in the forearm that pull the fingers. It is fun, as well as interesting, to actually squeeze these muscles with your right fingers and watch your left fingers move on their own. Do it to someone else (Fig. 2).

Counter-exercising and stretching

With enough counter-exercising and stretching, the extra step of massage may seldom be needed. Counter-exercising means to move muscles in the opposite direction to those they normally move in. For example, the left arm is rotated clockwise (very unnaturally) to play the violin; therefore it is important to regularly rotate anticlockwise as far as you can go, and move back and forth between the two extremes.

Stretching is the best, most healthy and natural way to keep the muscles in good shape. Rather than waiting until after you have finished working to warm down, you can stretch at regular intervals during breaks.

Approach any exercise very carefully. Do not force or strain. Never hurry into any action. Take your time. A number of smaller efforts is often much more effective than one larger effort, and there is less – if any – danger of straining something.

- There is naturally an endless number of different stretches you can do, but the specific ones for shoulder-instrument players focus on the arms and shoulders. A couple of examples:

Example 1 (simple)

- Drop your left arm by your side. Keep quite straight at the elbow.
- Raise your hand so that there is a 90° angle between the hand and the forearm (Fig. 2).
- Keeping the elbow straight, slowly rotate the arm clockwise (Fig. 3) and anticlockwise, gently stretching the muscles all the way up your arm and into your shoulder.

Example 2 (be careful)

This is a typical sports and yoga stretch:

- Place your left elbow on the crook of your right elbow (Fig. 4).
- Clasp your hands together, thumbs interlocking (Fig. 5).
- Slowly and gently raise your hands above your head (Fig. 6).

Minimum effort: the master formula

Master musicians, athletes, dancers or acrobats always makes what they do look easy, largely because by the time you are that good at something it *is* 'easy'.

Every athlete strives to gain greater and greater 'maximum power and minimum effort'. Imagine putting all your might and effort into hitting a golf ball, but the ball travels only a few metres. Then an expert takes the same club that you used and, seemingly without any effort at all, makes the ball travel hundreds of metres.

But suppose you too can hit the ball so that it travels hundreds of metres. F.M. Alexander was particularly fond of saying to everyone he worked with:

When you are pleased with yourself – when you have got there, when you have made it, when you have achieved what you set out to achieve, when you have got the result that you wanted – then try it again and see if you can get the same result, but using less effort. Then, do it yet again and see if you can get the same result with even less effort than that!

This is the Master Formula in any field or activity.

Next month's BASICS returns to the left/right hand, with