

Preventing Stiffness and Pain in the Lampworker

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Having been a lampworker for several decades myself I am well acquainted with the physical demands of the discipline. From personal experience I know that sitting at a bench for hours with shoulders raised while twirling a hot piece of glass in one hand and applying glass with other is not without consequences over time.

For many lampworkers the repetitive demand of such positions eventually expresses itself as some form of stiffness, aching or pain. This can be transient or chronic depending on many factors.

The most important concept to keep in mind is that the symptoms of soreness, aching and stiffness are the expression of some other problem and not the problem itself. They are the fire alarm that tells us that a fire is raging somewhere. However, it does not tell us where and why the fire's there, which brings us to the second important point.

If all we do is address the symptoms but not the reason for them, they will never be fully controlled and surely return, usually with a greater vengeance. Treating only the pain is similar to clipping the wires to the fire alarm and thinking that the fire has been put out.

Why do flameworkers get neck, back and shoulder stiffness and pain? The answer to this question lies in understanding what happens to our bodies when we work at the bench. This holds true whether we're sitting or standing. Let's look at neck and shoulder conditions first.

Anytime a piece of work is held in front of the body several interesting phenomenon begin to happen. As the shoulders round to hold the object in the flame the chest (pectoral) and shoulder muscles start to tighten up and shorten. Over time these muscles adaptively shorten from the repeated demands of having the shoulders rounded while "working the flame." In essence the muscles "grow short" and this is where the chain reaction to stiffness, ache and pain begins.



Jeffrey Spencer, "Leaky Pipes," 1999, 24" x 10" x 12." Photo courtesy of the artist.

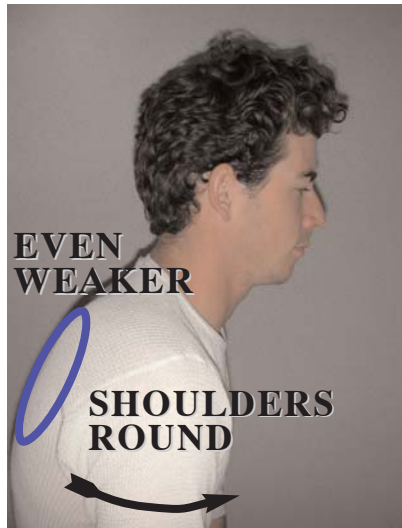
Whenever a muscle becomes tight or overactive it reflexively inhibits the muscle which works opposite it in the body. (Sherrington's law of reciprocal inhibition) The inhibited muscle, called the antagonist, acts like a weak muscle and cannot perform its function correctly. When this happens other muscles must then take over it's job and in the process they become prematurely strained and fatigued from the extra demand placed on them that they are not designed to handle.

This not only produces ache and pain in the muscles but also creates changes in posture that places excessive loads on the joints of the neck and shoulders that results in stiffness and pain. In summary, the sequence of events that culminates in most neck and shoulder complaints is as follows: when the shoulders round while working at the torch the chest muscles get tight which in turn inhibit the muscles (serratus and lower trapezius) that keep the shoulder blades flat and towards the spine. (Fig. D.1) This prompts the shoulders to round further because the muscles that should be holding them back are no longer doing so. (Fig. D.2)

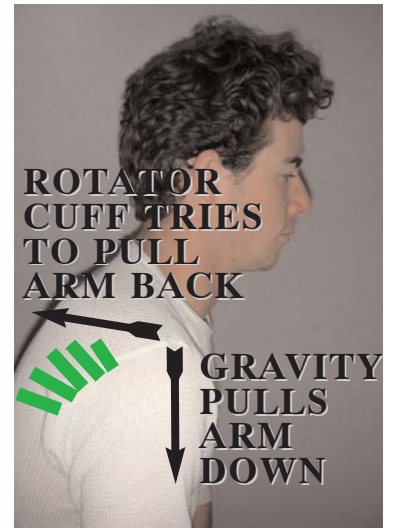
As the shoulder blades move forward, the shallow socket that the ball of the bone of the upper arm sits in rotates forward and downward. In this position gravity wants to pull the arm out of the socket. To prevent this the rotator cuff muscles must then continuously contract to pull the arm back into the socket. (Fig. D.3) The rotator cuff is not designed to do this. Its function is to only work when the arm is actively lifted up and away from the body. Since it is now recruited to be "on" all the



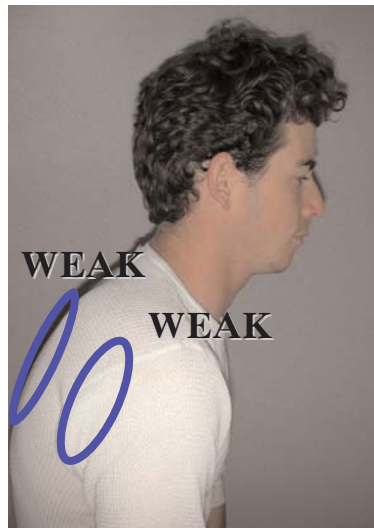
D.1. Tightening of the chest and inhibition of back muscles.



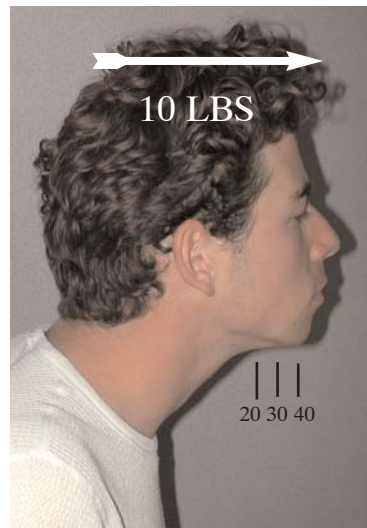
D.2. Worsening of rounded shoulders due to weakened serratus and lower trapezius.



D.3. The rotator cuffs must work full-time to pull the arm back into its socket.



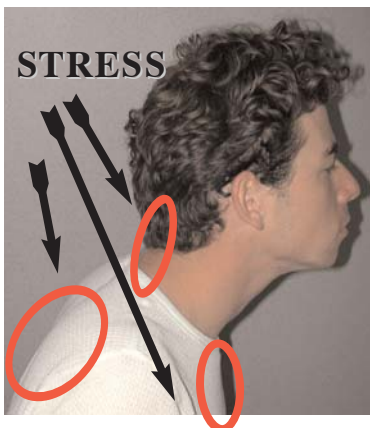
D.4. Resultant weakening of muscles.



D.5. Every inch the head moves forward creates ten pounds additional work for the neck muscles.



D.6. Additional tension in the neck to raise the eyes to see level.



D.7. Major stress zones resulting from rounded shoulders.



D.8. Tightening of hip flexors when sitting



D.9. Strain in the lower back and pelvic region.



D.10. Stress zones relevant to lampworking.

time, tremendous tension is generated in the muscles and eventually the body controls this abnormal tension by shutting off the muscles through a phenomenon called stretch weakness. Now both the muscles that keep the shoulder blades in place and move the arm away from the body (**Fig. D.4**) are inhibited and weak. This isn't the end of the domino effect though.

In order to maintain an open windpipe to breathe and speak freely in this "rounded shoulder" position, the head must move forward away from correct posture. Every inch the 10 pound head moves forward increases the demand placed on the neck and shoulder muscles by 10 pounds (**Fig. D.5**). This two to four fold increase in demand on these muscles leads to chronic muscle tension in the neck and shoulder muscles. To compound this, the muscles at the base of the skull must then tighten up to lift the head up so you can look straight ahead. (**Fig. D.6**)

The culmination of this adaptive posture is massive stress at the base of the skull, where the neck meets the upper back and in the shoulder socket. (**Fig. D.7**) This stress is further compounded by leaning or jutting the head forward or shrugging the shoulders as is often done when detailing a piece or as fatigue sets in. The symptoms of this abnormal stress, strain and compression include headaches, jaw, neck and shoulder stiffness and pain.

Why Do I Have Low Back Pain?

By far flameworkers have more neck and shoulder problems than those in the low back. In reality often the shoulder/neck issues are compounded by silent

problems in the low back/pelvic area. Most low back stiffness and pain results from the same phenomenon as seen in the neck and shoulders.

When we sit, the muscles that flex the hip shorten up. (**Fig. D.8**) As we lean forward or when fatigue sets in, we begin to slouch which flattens the low back and the low back muscles start to tighten. The tight hip flexor and low back muscles inhibit the stomach and buttocks muscles, which destabilizes the low back and places huge amounts of strain on the low back/pelvic junction. (**Fig. D.9**) This increased stress expresses itself as low back and hip stiffness and pain. Interestingly, as we lose low back stability and start to slouch, the shoulders round even further, escalating neck and shoulder problems.

Getting Rid of the Stiffness and Pain

Getting rid of and controlling the stiffness and pain generated from time at the bench is a matter of time and effort and "working smart." The main goal is to restabilize the body by stretching out the tight muscles, relaxing the tense muscles, strengthening the weak muscles and retraining the muscles to work together as a team where each is doing its job-not someone else's. It only takes a few minutes a day. The key is to do it regularly and prioritize the steps.

The biggest mistake most people make is to think their pain is from too weak muscles and that the solution is to strengthen up the sore, fatigued muscles by weight training. In reality the highest priority and place to start to restabilize the body is stretching the tight muscles. As long as a person has tight muscles he or she will always have inhibited/weak muscles, increased tension and pain. To try and develop strength with inhibited muscles will only overrecruit the wrong muscles to do the exercise and ultimately reinforce the problem.

In the next issue of the Flow, Dr. Spencer will continue the discussion with stretching exercises to prevent stiffness and pain.

Additional Reading:

King, Candice, "Avoiding Repetitive Stress Injuries with Dr. Robert Butler, Jr. D.C.," Glass Line, August/September 1998, Vol. 12, No. 2, p. 7. ■

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