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## **Faulty Respiration: An Often Overlooked Cause of Pain**

By Craig Liebenson, DC

Respiration is perhaps the most important of all movement patterns. Faulty breathing patterns can influence lumbar stability, upper thoracic posture, scalene and upper trapezius activity, and emotional states.

Respiration dysfunction can easily be assessed and treated. Normalization of respiration should be an integral part of a chiropractic rehabilitation practice.

The most important fault during breathing is lifting the thorax with the scalenes instead of widening it in the horizontal plane. This can lead to overstrain of the cervical spine. Prolonged work in constrained sitting postures promotes a forward drawn posture and abnormal respiration. The abdominal cavity becomes compressed and the scalenes along with the upper trapezius become more than accessory muscles of respiration. One result is a loss of the normal mobilizing effect of exhalation on thoracic spine extension. This further perpetuates the head forward, slumped posture and the fixed upper thoracic kyphosis.

Poor lumbar spine stability can also result from dysfunctional respiration. According to Vele both the abdominals and diaphragm should be thought of as sharing postural and respiratory function. Insufficient activity of the abdominal muscles results in a loss of diaphragmatic support for the spinal column. This can negatively affect the stability of the lumbar spine during lifting or bending activities.

### **Assessment**

During normal respiration the ribs should widen while the abdomen moves out in inhalation and in during exhalation. In dysfunctional respiration the scalenes, SCM, and upper fixators of the shoulder girdle raise the thorax during inhalation.

### **Test #1 - Supine**

Evaluation starts in a supine patient with observation of the movement of the abdomen. Abdominal respiration should predominate over chest breathing. The abdomen should move out in inhalation and in exhalation. A positive test is if abdominal movement is paradoxical or if there is greater chest than abdomen movement.

### **Test #2 - Relaxed sitting or standing**

Under postural conditions the trunk should broaden in the horizontal plane rather than raise up. The examiner's hands are placed on the patient's lower ribs bilaterally and motion is observed. The hands should move apart. A positive test occurs if the examiner's hands move upwards. Asymmetrical shoulder girdle elevation may also be seen. The collar bones may be seen to lift up. Also observed are deep upper clavicular grooves and SCM, scalenes, and upper fixators muscle tautness. In mild cases of dysfunction the above findings are not present unless the patient is asked to take a deep breath.

### **Test #3 - Prone**

During respiration in a prone patient a wave should be seen which starts caudal and moves cephalad. The SPs, especially in the thoracic spine, should open up like a fan as breath moves posteriorly into the thorax.

### **Grading the severity of respiratory dysfunction:**

1. Sitting deep inhalation only - mild;
2. Relaxed sitting or standing - moderate or loss of respiratory wave prone;
3. Supine - severe.

### **Treatment**

The general rule for improving respiration is to find a key manipulable lesion and treat that first, then provide advice about sitting posture and stress management; and finally, reeducate respiration through remedial exercise. Soft tissue or articular manipulation to mobilize a key joint such as the cervicothoracic junction or relax a key muscle like the scalenes may spontaneously improve respiratory function. Sitting advice such as the Bruegger technique will help the improvements from manipulation to last. Finally, neuromuscular reeducation of diaphragmatic respiration through remedial exercise must be trained to reprogram the improvements subcortically.

Treatment of faulty respiration will fail unless a new motor program is formed. According to Kotke<sup>5</sup> these are the stages of motor learning:

1. awareness
2. willful action
3. coordination training
4. new engram

Improving respiration is a great challenge to a rehabilitation specialist. Various muscles can be relaxed and joints adjusted, but if posture is not improved and the motor program for breathing re-educated, then treatment failure will result.

Postisometric relaxation (PIR) techniques can complement high-velocity short-amplitude adjustments of key joints. PIR techniques can be used for muscle relaxation, joint mobilization or joint traction. The following specific areas can be addressed.

Postisometric relaxation: <sup>1,3</sup>

- scalenes
- upper trapezius
- cervical spine manual traction (supine)
- lumbar spine manual traction (prone)
- thoracic spine extension mobilization (seated vs. wall)

### **Neuromuscular Re-education**

- press fixed elbows down vs. resistance during deep inhalation (seated);
- apply pressure on ribs during exhalation (laterally) release in during inhalation;
- Gayman's Technique - eyes forward, sit tall on stool; tip of tongue presses against the hard palate just behind the top teeth; hands supinated fingers above the thumbs; lift toes up with inhalation and press toes down with exhalation. While observing in a mirror that the clavicles do not raise up.

Home exercises form a crucial part of rehabilitation. To increase compliance a time efficient program can be established which will feel relaxing to the patient. <sup>4,5</sup>

## Self-Treatment

- Sitting on a chair with arm rests, press elbows down into arm rest during deep inhalation;
- Practice pushing belly out with inhalation & drawing in during exhalation;
- Thoracic mobilization into extension with exhalation against the wall;
- Prayer stretch position breath into ribs during inhalation.

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