

Re-education of faulty respiration

Faulty breathing is one of the most common dysfunctions affecting the musculoskeletal system. The diaphragm is one of the key muscles of the body, which often does not function properly. The kyphotic posture compresses the diaphragm and can result in scalene or upper trapezius hyperactivity. Forward head posture, upper rib dysfunction and symptoms in the head/neck or arm regions can often be related. Faulty respiration can compromise the deep spinal stabilisation system which depends on the transverse abdominus, internal oblique, multifidus, pelvic floor muscles and the diaphragm. It may be the case that altered breathing patterns represent one of the most important perpetuating factors of pain in the locomotor system.

Assessment

The diaphragm is the primary muscle of inhalation. The most common fault is substitution of the scalenes and upper trapezius for an inhibited diaphragm, thus resulting in the chest rising and falling during breathing, rather than the abdomen

C. Liebenson DC

10474 Santa Monica Blvd., #202, Los Angeles, CA, 90025, USA
Tel.: +1 310 470-2909; Fax: +1 310 470-3286;
E-mail: Clidc@flash.net

Received: July 1999

Revised: July 1999

Accepted: August 1999

Journal of Bodywork and Movement Therapies (1999)
3(4), 225-228

© 1999 Harcourt Publishers Ltd

This paper may be photocopied for educational use.

and chest moving in and out (see Fig. 1). This subjects the upper ribs and cervical spine to repetitive strain due to scalene overactivation. It also can negatively influence the scapulo-humeral rhythm due to excessive activation of the upper trapezius and levator scapulae.

If the scalenes and upper scapular fixators are overactive during respiration, shrugged shoulders, frequent sighing and failure of the lower ribs to widen in the horizontal plane will all be noted. Respiration can be assessed in the standing, sitting or supine lying postures. Typically, the dysfunction is less severe if only noticed in the upright positions. The most severe dysfunction is the presence of 'paradoxical respiration', where the belly moves in during inhalation and out with exhalation.

Management

Continuum of care

Key Advice: avoid slumped posture and be mindful of signs of stress such as sighing.

Key Manipulation: ribs 1-4 into depression.

Key Facilitation Exercises: Yoga.

Key Relaxation Exercises: upper trapezius, levator scapulae, scalenes.

Exercise prescription

Training Track for an Inhibited Diaphragm

1. *Manual resistance exercises for improving kinaesthetic awareness and volitional control of the diaphragm.*

- Supine or seated

- Clinician offers moderate resistance to the patient's effort into shoulder depression as they inhale deeply. Resistance is applied at the elbow.
 - **Goal:** encourage inhalation without shoulder shrugging.
- Clinician offers gentle resistance to the lateral lower ribs during deep inhalation.
 - **Goal:** encourage inhalation with widening of the lower ribs in the horizontal plane.
- Clinician offers gentle resistance to the abdomen during inhalation.
 - **Goal:** encourage inhalation with filling and expansion of the abdomen anteriorly.

2. Home Exercises

Functional Range Exploration Track:

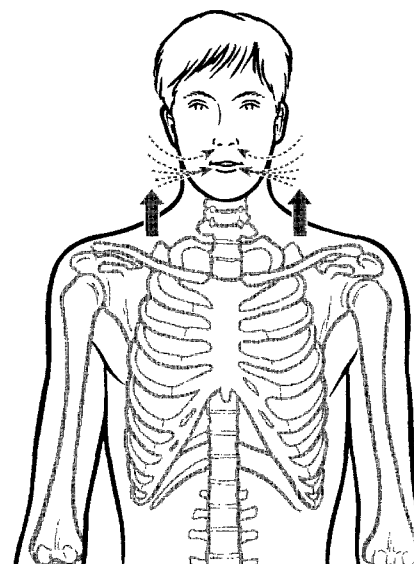


Fig. 1 Faulty respiration with elevation of clavicle(s) during typical inhalation.

- Supine, seated and standing belly breathing (see Fig. 1 in the 'Advice for the Patient' section).
- Encourage the patient to exhale slowly through pursed lips, then inhale through their nose while first filling their abdomen, then their lower chest and lastly their upper chest.
 - Utilize a mirror when performing in the seated or standing positions to monitor for excessive shoulder shrugging during inhalation.
- Thoracic mobilization into extension with exhalation against wall (see Fig. 2).
- Prayer stretch position – during inhalation allow ribs to expand posteriorly into flexion and then drop anteriorly into extension during exhalation.

Shoulder Depression Track:

- Sitting on a chair with arm rests, press elbows down into arm rests during deep inhalation (see Fig. 2 in the 'Advice for the Patient' section).

Troubleshooting for Isolating the Primary Respiratory Muscles:

- If progress is slow or there is difficulty in isolating the diaphragm, then this is often due to synergist overactivity (upper traps, levator scapulae, scalenes).

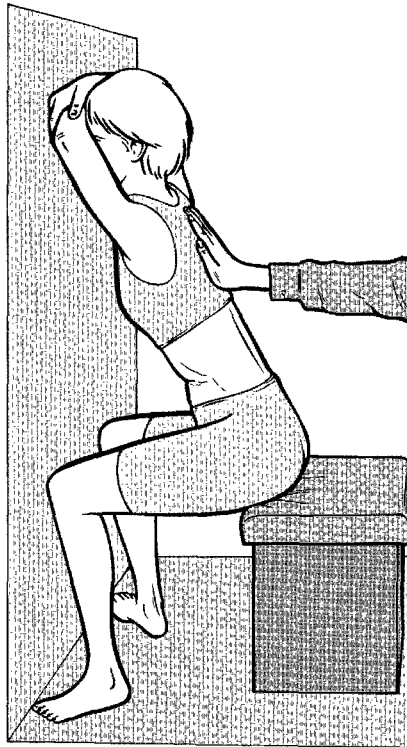


Fig. 2 Self-mobilization of the thoracic spine into extension.

- Ribs 1–4 and thoraco-lumbar fixations are common and should be addressed.
- The diaphragm may have soft tissue restrictions or trigger points under the ventral arch of the lower ribs requiring

relaxation and release. A simple procedure involves post-isometric relaxation

- Post-isometric relaxation technique for the diaphragm: patient starts to breathe in and then provides resistance to further breathing in by closing the nostrils for a few seconds. Then, the patient releases the resistance, finishes inhaling and then exhales very slowly. This should be repeated a few times.

BIBLIOGRAPHY

1. Lewit K 1994 The functional approach. *Journal of Orthopedic Medicine* 16: 73–74
2. Lewit K 1999, 3rd edition, Manipulative therapy in rehabilitation of the motor system. Butterworth-Heinemann, London
3. Lewit K 1980 Relation of faulty respiration to posture with clinical implication. *Journal of the American Osteopathic Association* 79: 525
4. Liebenson C, Murphy D, Perri M, DeFranca C 1998 The safe back workout: flexibility, breathing, and relaxation routine – videotape. Lippincott, Williams & Wilkins, Baltimore
5. Liebenson C, DeFranca C, LeFebvre R 1998 Rehabilitation of the spine – cervical–thoracic spine: making a rehabilitation prescription – videotape. Lippincott, Williams & Wilkins, Baltimore
6. Chaitow L 1997 Palpation skills – assessment and diagnosis through touch. Churchill Livingstone, New York