

*Dentalelle Tutoring*

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# Exercise Needs

For the Dental Hygienist

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# Work-related Injuries

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Epidemiological studies during the past decade have demonstrated a high incidence of work-related shoulder injuries among dental professionals, most likely due to their sustaining static postures, repeatedly moving within a small range of motion, and completing their work within limited space.<sup>1-7</sup> The mechanical load placed on the neck and shoulder during sustained postures often creates an imbalance in muscle length and in the strength of the muscles used to sustain postures and perform repetitive motions.<sup>8</sup> These all contribute to postural adaptation.<sup>9</sup>

Muscle imbalance is the weakness of one muscle/group while its antagonist is strong.<sup>10,11</sup> The weaker of the two muscles/groups is usually elongated, while the stronger is shortened.<sup>10,11</sup> Shoulder injuries commonly experienced by dental hygienists, such as upper trapezius and levator scapulae myalgia, thoracic outlet syndrome, and supraspinatus tendinitis,<sup>2</sup> are often related to muscle imbalance. For example, a prolonged scapular elevation posture that is common among dental hygienists requires the upper trapezius and levator scapulae muscles to contract isometrically. The activation of these two muscles without alternation in muscle length reduces blood circulation, creates microtrauma, and, over time, leads to upper trapezius and levator scapulae muscle pain. Static contraction of the upper trapezius and levator scapulae muscles also results in adaptive shortening of these muscles and leads to an elevated scapula. As the scapula becomes elevated, the lower trapezius muscle (the antagonistic muscles of the upper trapezius and levator scapulae) becomes elongated and begins to weaken,<sup>3</sup> thereby increasing the susceptibility to future injury.



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Another common posture among dental hygienists is the forward or rounded shoulder. When sustaining this posture, the anterior muscles, such as the pectoralis minor and pectoralis major muscles, become shortened, stiff, and tight.<sup>3,7,10</sup> Tightness of the pectoralis minor compromises mobility of the brachial plexus, particularly the ulnar nerve, and the axillary artery and vein that run beneath the muscle. The increase in compression associated with tight muscles may lead to thoracic outlet syndrome (a group of distinct disorders that affect the nerves in the brachial plexus and various nerves and blood vessels between the base of the neck and armpit). Tightness of the pectoralis minor also contributes to elongation of the lower and middle trapezius muscles, which can reduce the force generating capabilities of the muscles. Weakness in these two trapezius muscles disrupts the upward rotation of the scapula necessary during arm elevation, thereby contributing to shoulder impingement, supraspinatus tendinitis, and rotator cuff injury.

Dental hygienists maintain the shoulder abduction position more than 50% of the time while working.<sup>4</sup> To maintain the position of the humeral head within the glenoid fossa, activation of the deltoid muscle (glenohumeral abductor) must be counterbalanced by adequate activation of the rotator cuff muscles. Imbalance between activation of the deltoid and rotator cuff muscles, particularly subscapularis muscle, often leads to the anterior and/or superior translation of the humeral head relative to the glenoid fossa. Inability to control the humeral head position during arm elevation can lead to impingement syndrome of the shoulder (a common shoulder condition seen in aging adults closely related to shoulder bursitis and rotator cuff tendinitis), bicep tendinitis, and rotator cuff injury.<sup>11</sup>

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# Shoulder

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Several exercises can provide you with increased muscle strength in the shoulder region. Here are a few.

To strengthen the shoulder muscles that rotate your arm forward, lie on your back on a firm surface, such as a table or open bench. With one hand, support the opposite shoulder. Placing the supported arm at a 90-degree angle, move it forward as far as you can go without letting your back lift up. Stretch the arm for a couple of seconds by holding that position, then return it to the starting point. Repeat this process up to five times, then switch arms.

To strengthen the shoulder muscles that rotate your arm backward, use the same table and turn over on to your stomach. Your arm should be at a 90-degree angle pointing down. Rotate your arm backward towards the ceiling, without moving your elbow, as far as you can. Repeat this up to 10 times, then switch to the other arm.



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# The Back

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Your back muscles are part of the body's core. Strengthening this area can improve your posture dramatically.

The Cat Stretch is a yoga technique that stretches out the muscles of your back and shoulders. Begin with your knees on the floor, and lower your hands so they are resting there too. You should now be down on all fours. Pull your waist down toward the floor, push your shoulders back while arching your head up so you are looking toward the ceiling. You should feel a stretch in your lower back. Reverse the position by pushing your shoulders and head downward and arching your back, much like a cat does. Repeat this as many as 10 times.

Pelvic tilt will provide a way to strengthen the muscles that support your hips and lower back. Lie on your back with your knees bent and your hands, palms down, to the side.

Push on your heels and raise your hips toward the ceiling. Be careful not to arch your back; move your body as one piece to avoid injury. Hold your hips in this position while you count to five, then lower slowly. Repeat this five times.

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# Stretching

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Stretch your muscles before each shift to warm them up. For your shoulders, you might reach one arm toward the ceiling and stretch out the muscles on that side. Warming up before work will keep your back from becoming stiff while working on patients and improve your mobility. Stretch frequently during the day to keep that stiffness from returning.

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# You Tube Video!

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- ❖ <https://www.youtube.com/watch?v=2Bw1T4MNZhE>



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# Issues

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## **Some Signs of MSDs**

- Decreased range of motion
- Loss of normal sensation
- Decreased grip strength
- Loss of normal movement
- Loss of coordination

## **Some Symptoms of MSDs**

- Excessive fatigue in the shoulders and neck
- Tingling, burning, or other pain in arms
- Weak grip, cramping of hands
- Numbness in fingers and hands
- Clumsiness and dropping of objects
- Hypersensitivity in hands and fingers



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# Issues

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## **Some Risk Factors for MSDs**

- Repetition
- Forceful exertions
- Awkward postures
- Contact stress
- Vibration
- Poorly designed equipment/workstation
- Improper work habits
- Genetics
- Medical conditions
- Poor fitness level
- Physical/mental stress
- Lack of rest/recovery
- Poor nutrition
- Environmental factors
- Poor lighting

## **Off-the-Job Activities That Can Contribute to MSDs**

- Home computer use
- Repetitive activities using the fingers
- Sports activities
- Prolonged/awkward postures at home
- Use of household tools
- Activities involving repeated heavy lifting, bending, twisting, or reaching

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# Maintaining Good Posture

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(1) *Always try to maintain an erect posture.* By positioning your chair close to the patient, you can minimize forward bending/excessive leaning over the patient. Keep your feet flat on the floor to promote a neutral or anterior tilt to your pelvis, which keeps your back aligned and promotes the natural curvatures of your back. Remember that your head weighs as much as a bowling ball, and when you lean forward and flex your neck, you force your muscles to hold up the weight of your head, rather than the bones and discs in your spine.

(2) *Use an adjustable chair with lumbar, thoracic, and arm support.* Having a good chair is essential in maintaining good posture, because what you sit on provides the base of support from which you work all day long. When you think about it, you work 8 or more hours per day, 5 days per week, 4 weeks per month, and about 11 months out of the year, which makes a high-quality chair with adjustable features well worth the cost of saving your back, neck, arms, and hands. You should look for important features like adjustable height, width, tilt, backrest, seat pan, and armrests, because in most dental offices many people of different sizes use the same workstation.

(3) *Work close to your body.* Position your chair close to your patient, and position your instrument tray close to you. This way, you don't have to overextend yourself to reach your patient or your instruments, putting excessive stress on your back, shoulders, and arms. Think of the 90° rule of having your elbows, hips, knees, and ankles all forming 90° angles. If you find yourself reaching out far beyond these angles too often, then you're not properly positioned and you should adjust the position of your chair/instrument tray.



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(4) *Minimize excessive wrist movements.* Be conscious of how you position and move your wrists, and try to keep them in a neutral position (palms facing each other, shoulder width apart with wrists straight), which puts your muscles and tendons in a much better relationship to perform the work. You will have to move your wrists into various positions as you work on your patients, but try to be aware of these movements so you can minimize potentially damaging hand positions.

(5) *Avoid excessive finger movements.* When you combine the excessive forces needed to hold your instruments with the amount of repetitions that you perform each day, you can see the tremendous toll that this takes on the small muscles of your fingers. Retrain yourself to use your shoulders and arms to position your hands, rather than making the small, forceful movements with your fingers.

(6) *Alternate work positions between sitting, standing, and side of patient.* Switching positions allows certain muscles to relax while shifting the stress onto other muscles and increasing your circulation. When you work on alternate sides of the patient or rotate the position of your instrument table, you allow each side of your body to share the stress, rather than performing the same motion in the same way, which causes cumulative trauma in the overused side.



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(7) *Adjust the height of your chair and the patient's chair to a comfortable level.* If your chair is too low and the patient's chair is too high, this causes you to elevate your shoulders and can lead to neck problems and pinched nerves. Alternately, if your chair is too high and the patient's chair is too low, you'll have to flex your neck down and bend your wrists back to compensate, which can lead to neck and hand problems. Remember the 90° rule and keep your elbows at a 90° angle with your wrists straight and shoulders relaxed.

(8) *Consider horizontal patient positioning.* If your workstation allows the patient to be reclined into a horizontal position, this allows you to sit above the patient's head with good ergonomic posture, and you can use each arm equally in more natural positions. If the workstation does not accommodate this position, consider buying a quality reclining chair for the patient when you replace the old one.

(9) *Check the placement of the adjustable light.* Position the adjustable light so you don't have to strain your neck to be able to see in the patient's mouth. It is important to adjust this light with each new patient because of the different height of each person. The light should be adjusted again when a new dentist uses the workstation because his/her sitting eye height is different, and this will affect his/her ability to see into the patient's mouth.

(10) *Check the temperature in the room.* Make sure the temperature in your workspace is not too cold because this will decrease the circulation and blood flow to your extremities. Most often, the dental work environment is damp and cold, so be certain to wear gloves and warm up your hands before working on a patient.

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# Resources

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- ❖ [http://www.ehow.com/way\\_5549101\\_posture-exercises-dental-hygienists.html](http://www.ehow.com/way_5549101_posture-exercises-dental-hygienists.html)
- ❖ <http://www.dimensionsofdentalhygiene.com/>
- ❖ <http://www.dentistrytoday.com/ergonomics/>

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