14 EXERCISES THAT CAN WORSEN THE HEALTH OF DENTAL PROFESSIONALS

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Imagine hiring a personal trainer, participating in a CrossFit program or simply trying a new gym machine to help improve your musculoskeletal health, *only to end up in more pain than when you started!* Unfortunately, I hear numerous accounts of this occurring among dental professionals. Most healthcare professionals do not realize that dentists are predisposed to unique muscle imbalances--certain generic exercises, that are not a problem for the general population, can throw the dental professional into a vicious pain cycle. When team members come to understand these muscle imbalances, the proverbial light bulb appears…"Ah, that's why I always had pain after that exercise."

In order to perform the precision tasks of dentistry, the arms must have a stable base from which to operate. For example, the delivery of dental care requires excellent endurance of the shoulder girdle, rotator cuff and core stabilization muscles for safe shoulder movement and working posture (Fig. 1-in blue). These stabilizing muscles tend to fatigue quickly with forward head, rounded back and elevated arm postures—all commonly seen among dental operators. When these muscles fatigue, other muscles compensate and become overworked, tight and oftentimes painfully ischemic (Fig. 1-in red).

Fig 1A

Fig 1B

Figs 1A & 1B: Dental professionals should avoid excessive strengthening of muscles that tend to become overworked, tight and ischemic (in red). Muscles that should be targeted for endurance training include specific shoulder girdle and trunk stabilizing muscles (in blue). *Note: Many important stabilizing muscles that lie deeper are not shown in diagram.*

Another common imbalance among team members is in the shoulder, caused by over-strengthening the deltoid and supraspinatus muscles. These muscles already tend to be tight due to frequent posturing chairside with the arms lifted away from the sides of the body. This imbalance can cause improper movement at the shoulder joint, with painful impingement of the rotator cuff tendon and a myriad of other shoulder dysfunctions. Rather, the *rotator cuff stabilizing muscles* should be targeted in the dental professional's exercise program.

Fig 2: Exercises that can worsen the rotator cuff imbalance and lead to impingement: Left) **Deltoid lift**, and Right) **shoulder abduction machine**.

The muscle imbalance that tends to develop between the abdominal and low back muscles is especially problematic in seated dentistry. Leaning toward a patient repeatedly with rounded back posture can cause strain and overexertion in the superficial low back extensors, while the deep stabilizing abdominal muscles (transverse and oblique abdominals) tend to become weaker. **Full sit-ups** and the **crunch machine** (right) target the rectus abdominis, which bends the body forward. When done excessively, over-strengthening of the rectus abdominis can worsen posture and cause flattening of the lumbar spine. In addition, the last half of the full sit-up strengthens the hip flexors--something that dental professionals should avoid! Rather, dental professionals should be strengthening the *transverse abdominal muscles* (their natural backbelt) which research shows stabilizes the lumbar spine and helps prevents low back pain.

Another imbalance occurs between the pectoralis muscles, which become short and tight when working in front of you for prolonged periods of time and the interscapular muscles. **Bench presses and pectoralis strengthening machines** (left) can put you on the fast track to worsening this imbalance, resulting in rounded shoulder posture, impingement or thoracic outlet syndrome.

Certain Pilates exercises should be modified or eliminated altogether. The **Bicycle, Control Balance** and **Roll Over** exercises all place a high compressive force on the cervico-thoracic junction, and should be avoided. There is also little stability or control with these exercises. The **Rocker with Open Legs** should be modified so only the first position (sitting upright with legs open) is practiced. The **Rocking** exercise compresses the vertebral joints and is a high risk exercise, especially for people over age 40.

Rocker with open legs

Rocking

Control Balance

Roll Over

Pilates is unregulated in the United States, and many instructors still teach some of the original Pilates exercises that lack a stability component. To be safe, make sure your instructor is certified by APPI (Australian Physiotherapy & Pilates Institute), whose curriculum is designed by actual physical therapists to ensure safety, and the original Pilates exercises have been modified based on scientific evidence.

I love yoga for dental professionals, as it addresses two important aspects: flexibility and relaxation. Remember, that yoga should never be a substitute for the very specific muscular endurance training that is needed for dental professionals to correct their imbalances.

Some yoga moves should be modified for female dental professionals. Firstly, since women tend to be more flexible than men, they are more vulnerable to over-extension injuries, so listen to your body and avoid the extreme poses. Secondly, women in dentistry are prone to hand/wrist injuries, so weight bearing through an extended wrist dramatically increases pressure in the carpal tunnel and should be avoided. **Downward dog** can be **modified** to avoid this problem by using a low chair and keeping the wrists straight. (right)

Finally, the **Locust** exercise (left) places high compressive loads on the lumbar spine and should be avoided by persons prone to low back pain.

P90x and Crossfit are both fitness crazes that are extremely popular today. The attraction is a brief 20-30 minute intense circuit-type workout. The downside of these regimens is that if you aren't properly conditioned, you fatigue quickly, which leads to poor form and poor stability, which in turn then leads to injury—frequently of tendons.

In the P90X routine, the **single-arm push up** is perhaps the riskiest exercise for dental professionals. The shoulder is the least stable joint in the body, and one of the most frequently injured joints in team members, due to weak rotator cuff and shoulder girdle stabilizers.

The **upright row** (left) is the other P90X exercise that dental professionals should consider removing altogether from their routine. While this may be fine for the general public, dental professionals are highly prone to an imbalance between the upper trapezius and middle/lower trapezius muscles, often resulting in trapezius myalgia. The **upright row machine** (right) simulates this exercise and can also put you on the fast track to worsening this painful syndrome.

Of the Crossfit exercises, the **overhead deadlift** is undoubtedly the most unsafe exercise for dental professionals, as it is a ballistic movement with little stabilization that places a heavy load on the upper trapezius and shoulder joint. Both areas are prone to injury in dental professionals. **The military press (overhead press) machine** also targets the upper trapezius but in a more controlled manner—but it is still a risk for causing or worsening trapezius myalgia in team members!

Another Crossfit exercise, the **kettleball swing,** also should be avoided. It is a ballistic exercise that targets the 'red' muscles in Fig. 1A. Team members typically have tight pectoralis & anterior deltoids, and this exercise can worsen the biomechanics in the shoulder leading to rotator cuff impingement, thoracic outlet syndrome or other problems.

DEVELOPING AN EFFECTIVE EXERCISE REGIMEN

*This is just a **partial list** of the exercises, gym machines, Pilates, P90X and Crossfit exercises that are problematic for dental professionals.* An effective exercise regimen for dental professionals will target specific shoulder girdle, rotator cuff, trunk and back stabilizing muscles, *without* engaging the muscles that are prone to tightness and ischemia. This requires expert knowledge of biomechanics, kinesiology, anatomy and dental ergonomics. In addition, specific muscles that are prone to tightness and ischemia must be targeted with stretching exercise and avoid over-strengthening. These concepts are the cornerstone of the evidence-based DVD, On the Ball Home Exercise for Dental Professionals.

As long as you are delivering dental care chairside, you should be regularly correcting your muscle imbalances with proper exercise, since dentistry is an exacerbating activity. After you have developed a foundation of balanced musculoskeletal health and are pain-free, you may carefully venture into a select few weight training exercises, adding only one at a time, but only if you continue your baseline stabilization exercises. I wish you well, and practice in good health!

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