IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)
e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 23, Issue 3 Ser. 4 (March. 2024), PP 34-41
www.iosrjournals.org

Unlocking Comfort: How Ergonomics Can Prevent Carpal Tunnel Syndrome In The Workplace

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Abstract:

Work-related musculoskeletal disorders (WMSDs) are a prevalent occupational concern, with musculoskeletal disorders (MSDs) ranking as the second most common cause of temporary work impairment. This article focuses on the significance of ergonomics in preventing and managing one such MSD – carpal tunnel syndrome (CTS), particularly among dentists. CTS arises from the compression of the median nerve within the carpal tunnel, leading to pain, numbness, and weakness in the hand and wrist. Dentists, due to repetitive motions and prolonged uncomfortable postures, face an elevated risk of developing CTS. Understanding the carpal tunnel's anatomy and the multifactorial nature of CTS pathophysiology is crucial. Early diagnosis is essential as CTS progresses through stages, from minor symptoms to severe functional limitations. The Occupational Safety and Health Administration (OSHA) underscores the role of ergonomic design in enhancing worker satisfaction, reducing injury rates, and promoting productivity. Implementing ergonomic practices in dentistry is imperative for a healthier work environment and mitigating the impact of WMSDs, particularly CTS, on occupational well-being.

Key Words*: Carpal tunnel syndrome, Ergonomics, Musculoskeletal disorders*

Date of Submission: 13-03-2024 Date of Acceptance: 23-03-2024

I. Introduction

Musculoskeletal disorders (msds) have a significant impact on the workplace and are becoming an increasingly prevalent issue in today's cultures. According to research, msds are the second most common cause of temporary work impairment, behind the common cold. Many working populations experience morbidity as a result of work-related musculoskeletal diseases (wmsds), which are recognized as a significant occupational issue that lowers quality of life, reduces productivity, and raises health care and compensation expenses.[1]

The term "work-related musculoskeletal illnesses" refers to conditions that affect ligaments, spinal discs, muscles, cartilage, nerves, joints, and tendons and result in chronic, progressive development.they are also referred to as cumulative traumatic disorders (ctd) or repetitive motion injuries (rmi).these conditions can cause pain and functional impairment in a variety of body parts, including the hands, neck, shoulders, elbows, wrists, and upper and lower back.a number of risk factors contribute to the development of msd's can be categorized into physical, psychological, organizational, and individual aspects. Physical factors include things like bad posture, ergonomics, lifting and working with repeated movements.pain, discomfort, numbness on extremities, burning, soreness, swelling, restricted range of motion, and loss of power are signs of musculoskeletal problems. The risk of wmsds is recognized to be greater for those in the health care industry. It has been stated that healthcare workers are susceptible to developing musculoskeletal diseases as a result of their daily work routines. Hill et al. In 2010 reported msds to be one of the most common and leading causes for early retirement among dentists (29.5%).the prevalence of musculoskeletal pain in dentists ranges between 64% and 93% with the back and neck being the most affected regions.more than 70 percent of dental students of both sexes

reported neck, shoulder and lower back pain by third year of dental school.and 3.5 percent of general population reported with wrist pain associated with carpal tunnel syndrome[2,3]

The carpal tunnel is a small, approximately one-inch-wide passage in the wrist that houses the flexor tendons and median nerve, which are responsible for bending the thumb and fingers.carpal tunnel syndrome is caused by the tunnel narrowing or swelling of the tissue surrounding the flexor tendons, which puts pressure on the median nerve and lowers the blood flow to it.the hand may become weak, numb, tingly, or painful as a result of this unusual pressure on the nerve.pain or tingling that wakes the patient in the middle of the night and is relieved by shaking or rubbing the hand is regarded as a diagnostic hallmark symptom.an upper extremity injury that is exacerbated by overuse, improper work postures, or repetitive motions is the cause of carpal tunnel syndrome, an occupational ailment.potential causes include trauma, excessive exertion, and uncomfortable, repetitive motions that depart from the near-neutral posture, as well as squeezed median nerve in the wrist.carpal tunnel syndrome is therefore categorized as a cumulative trauma illness.over the past ten years, the significance of carpal tunnel syndrome in relation to repeated work has increased.the pathophysiology behind the development of musculoskeletal disorder is prolonged static posture that leads to muscle fatique or muscle imbalance reducing the blood supply causing muscle ischemia resulting in necrosis/trigger points and muscle substitution leading to pain. As a result of pain protective muscle contraction occurs resulting in joint hypomobility/ nerve compression/spinal disc degeneration which ultimately leads to the development of musculoskeletal disorder.therefore it is essential for dentist to practice dentistry with proper ergonomic design to prevent the development of work related musculoskeletal disorder

When motivational speaker asked everyone to work as per the hands of clock, dentist took it literally for clinical position that is 1o' clock position 2o' clock position. This is where ergonomics comes into picture!

The name "ergonomics" comes from two greek words: "labor" (ergon) and "principles or laws" (nomo's).also known as human engineering that is based on proprioceptive derivation. Osha (the occupational safety and health administration) refers to the word 'ergonomic' as the relationship of the human/environmental interface that does not produce injury. It is an applied science that coordinates the design of devices, systems and physical working conditions with the capacities and requirements of the worker.it is a way to work more productively by giving practitioners the instruments, gear, and workstations to do their jobs as securely and effectively as feasible. Ergonomic design raises worker satisfaction, lowers injury rates, and promotes productivity.this article put emphasis on carpal tunnel syndrome its prevention and management.

Carpal tunnel syndrome

Anatomy of carpal tunnel

On the anterior part of the wrist, there is a small opening called the carpal tunnel.a non-extendable osteofibrous wall forms the carpal tunnel (ct), a tunnel that shields the flexor tendons and median nerve.

Borders

Two layers make up the carpal tunnel: the superficial flexor retinaculum and the deep carpal arch. The transverse carpal ligament (flexor retinaculum) crosses over the concave surface of the deep carpal arch to create a tunnel.

The carpal arch, a profound arch made of the palmar aspect of the carpal bones, forms the floor of the carpal tunnel. The pisiform bone and the hamate hook border this arch medially, and the scaphoid and trapezium bones' tubercles border it laterally.[4]

The flexor retinaculum, also called the transverse carpal ligament, is a thick ligament made of connective tissue that forms the roof of the carpal tunnel. This ligament creates a tunnel-like structure by bridging the gap between the medial and lateral ends of the carpal arch.

Contents

The carpal tunnel contains a total of **9 tendons**, surrounded by synovial sheaths, and the **median nerve**.

The flexor tendons include four tendons from the flexor digitorum profundus; four tendons from the flexor digitorum superficialis; one tendon from the flexor pollicis longus.

The median nerve splits into the palmar digital nerves and the recurrent branch when it exits the carpal tunnel.the dorsal nail beds and palmar skin of the lateral three and a half digits receive sensory innervation from the palmar digital nerves. The lateral two lumbricals receive motor innervation from them as well. The thenar muscle group is supplied by the recurrent branch.

Significance of carpal tunnel

Carpal tunnel syndrome is a common condition when the median nerve becomes entrapped due to the constriction of the carpal tunnel.on the hand's thumb side, the median nerve supplies movement and sensation. This covers the entire hand, including the thumb, index, middle, and ring finger side on the thumb side.the

carpal tunnel is a constricted, inflexible bone and ligament channel located at the base of the hand.[5] the tunnel narrows and the median nerve becomes squeezed due to the thickening of inflamed tendons or other inflammation. Pain, weakness, or numbness in the hand and wrist that travels down the arm may be the outcome. Studies in the past have not yet measured the precise quantity and kind of repetitive motions made during dental procedures. Repetitive motions throughout extended clinical periods have been found by several researchers to be a predictive factor for the high frequency of cts among dental hygienists.[6]

Pathophysiology of carpal tunnel syndrome

Environmental, social, occupational, and patient-specific factors often combine to cause cts, which is a multifactorial condition. Because of this, unless a clear physical finding directly explains the patient's symptoms, a single, specific cause is typically not identified. The pathology linked to cts typically arises from a blend of traction and compression on the median nerve. There is a harmful cycle associated with the compressive factor, which includes elevated pressure, blockage of the entire venous outflow, accumulation of localized edema, and disruption of the intraneural microcirculation of the median nerve. Lesion development on the myelin sheath and axon compromises nerve function by inducing inflammation and disrupting the normal physiological protective and supportive functions of surrounding connective tissues. The compromised structure of the nerve exacerbates the dysfunctional milieu.

Repeated wrist motions and traction aggravate the dysfunctional environment, resulting in additional nerve damage. Furthermore, the median nerve may be compressed by an inflammation that affects any of the nine flexor tendons that travel through the carpal tunnel. Prior to motor fibers, sensory fibers are frequently impacted, and autonomic nerve fibers housed within the median nerve can also sustain injury.[2,3]

Causes and risk factors of carpal tunnel syndrome

People with carpal tunnel syndrome frequently don't know what caused it. Repetitive motions may be the cause. This applies particularly to actions made with the hands below the wrists.intense or repeated grasping or vibration during repetitive tasks at work may further exacerbate symptoms. Determining whether job-related activities are the primary cause of symptoms or if work is merely exacerbating pre-existing conditions is a challenging task.

Forceful pinching or grasping, prolonged uncomfortable wrist postures, vibration, and repetitive hand motions are risk factors for carpal tunnel syndrome

Dentist are particularly suceptible to musculoskeletal disorder due to the nature of their work. Studies have found that 44 percent reported with shoulder pain and 38 percent reported hand pain.[7] musculoskeletal disorders have been identified in dental hygiene students and registered dental hygienists, which can have a negative effect on their longevity in the field as well as their day-to-day performance.rdhs in general dentistry practices reported shoulder pain more often, while those in periodontal practices reported forearm pain. Rdhs experienced neck pain when using hand scaling, and shoulder, upper back, or lower back pain when using ultrasonic scalers for more than two days. In view of that, reinforcing ergonomics into the dental hygiene curriculum may benefit the rdhs.

Signs and symptoms of carpal tunnel syndrome

The signs include a persistent, dull pain in the wrist or hand.abrupt numbness in the thumb, index, middle, or ring finger's "thumb-side". Pains that resemble sharp needles and radiate over the fingers. Frequent tingling in the palm, fingers, or wrist. Impairment of motor skills (e.g., pain when buttoning a shirt, zipping a jacket, having trouble holding objects, etc.).

Carpal tunnel syndrome can cause a variety of symptoms, from tingling to total loss of function to a little burning feeling.other typical symptoms include a throbbing pain at the base of the thumb, which can occasionally extend to the neck, changes in touch or temperature perception, grip weakness, swelling in the hand and forearm.frequently, symptoms start during the work shift and get worse at night.this exaggeration could result from swelling in the carpal region and ischemia of the median nerve from immobility. The thumb, index, and middle fingers, as well as the palmar-radial side of the ring finger, are among the hand regions innervated by the median nerve that experience symptoms.carpal tunnel syndrome symptoms often affect the dominant hand, however they can also occur bilaterally (in both hands) or in the less dominant hand in many situations.a patient should be diagnosed with carpal tunnel syndrome if they have any tingling or numbness in their fingers combined with weakness or atrophy of the thenar muscle.[8,9]

The majority of people with carpal tunnel syndrome report having numbness across their hands, but a more thorough examination reveals that the little finger which is supplied by the ulnar nerve remains unaffected by carpal tunnel compression by the median nerve

Stages of carpal tunnel syndrome

Stage 1 early stage

Minor symptoms such sporadic numbness, weakness, or tingling in the wrist or hand are indicative of an early stage of cts. Usually more noticeable at night, these symptoms might be eased by shaking or moving the hand or wrist.[10]

Stage 2 moderate stage

A moderate stage of cts characterized by more frequent or continual symptoms. Tingling, numbness, and wrist or hand weakness symptoms can happen during the day and make it difficult to carry out regular duties. Usually, there is pain and a decrease in grip strength.

Stage 3 severe stage

A severe cts stage characterized by ongoing symptoms that limit functioning. Muscle atrophy and severe hand weakness are possible symptoms. Most people struggle to complete basic things like turning on a doorknob.[11]

The degree of symptoms varies greatly in people with cts, and not everyone will go through all of the stages listed above.

Complication of carpal tunnel syndrome

Atrophy and weakness of the muscles at the base of the thumb in the palm are rare complications of carpal tunnel syndrome. If this isn't fixed right away, it might become a lifelong issue. This may cause the afflicted fingers to lose their dexterity.

Examination for carpal tunnel syndrome

Inspection

The first step in the clinical examination for carpal tunnel syndrome should be to look for symmetry, muscle atrophy, and osteoarthritis in the hands. Since the median nerve innervates the abductor pollicis brevis, flexor pollicis brevis, and opponens pollicis, late stages of carpal tunnel syndrome can result in significant thenar atrophy. Comparing the affected hand to the unaffected hand, one can palpate or see the signs oflateral atrophy.

Motor exam

The lumbricals of the first and second digits, as well as the abductor pollicis brevis, flexor pollicis, brevis, and opponens pollicis (which collectively form the thenar eminence) receive motor innervation from the median nerve. The abductor pollicis brevis is the most accurate indicator of median nerve motor dysfunction because the flexor pollicis brevis, opponens pollicis, and lumbricals all have different degrees of overlapping innervation from other nerves. This can be accomplished by having the patient place their hand palm side up on the examination table and flex their thumb.tell the patient not to move, and try to push their thumb flat against the table with your middle finger. A simultaneous palpation of the thenar eminence with your index finger can be used to measure the extent of muscle contraction during the patient's resistance to movement. Use the mrc grading system (0–5) to determine the degree to which the patient can resist movement.

Abductor pollicis brevis strength assessment: put the patient's thumb in abduction, tell them to resist movement while pressing the thumb into adduction, and feel the thenar eminence to determine the strength of the abductor pollicis brevis, which is only innervated by the median nerve.

Sensory exam

Using a rating scale of 0 to 10, where 10 represents normal sensation and 0 represents no feeling at all, evaluate the sensory distribution of the median nerve. The patient should first close their eyes. The patient should then be instructed to tell you how each of the following areas feels, on a scale of 0 (no sensation at all) to 10 (this sensation), in the area you have chosen (such as the forearm), after you gently stroke the area with your finger. Next, lightly stroke the hand's median nerve-innervated areas, noting any areas where sensations are diminished or abnormal.comparatively evaluating the sensation of the ulnar and median nerve- innervated areas can also be helpful (for instance, comparing the palmar thumb and fifth digit sensation).[12] a comparison of the same anatomic location's sensation on each side can be helpful if the patient's symptoms are unilateral. Notably, even in severe cases of carpal tunnel syndrome, the thenar eminence should remain numb due to the palmar cutaneous branch of the median nerve exiting proximal to the carpal tunnel and providing sensory innervation to the area.

Diagnostic test

Tinel's sign test

If a person experiences paresthesias when tapping the median nerve at the wrist crease, the tinel's sign test is positive for carpal tunnel syndrome.[13,14]

The wrist flexion test or phalen's test

Place the patient's elbows on a table so that their forearms are vertical and allow them to flex for one minute. This is known as the phalen's test, or wrist flexion test. If there is paresthesia following this test, the result is considered affirmative.

Tourniquet test

A sphygmomanometer cuff is placed on the arm and inflated to a pressure more than 200 mmhg for a duration of two minutes in order to perform the tourniquet test. A certain amount of medial nerve compression is evident if the thumb and palmar side of the first three fingers hurt, tingle, or become stiff.

Finkelstein's test

Finkelstein's test involves the patient deviating the wrist in an ulnar manner while holding the thumb between the fingers. This test is designed to evaluate abductor tendon issues that present similarly to carpal tunnel syndrome. If this results in pain, the test is positive for abductor dysfunction; otherwise, the patient is believed not to have carpal tunnel syndrome if the results of other tests are unclear.

Pressure provocation test

If the examiner presses with his or her thumb on the palmar aspect of the patient's wrist at the level of the carpal tunnel for 60 seconds and the patient experiences pain, tingling, or numbness in the distribution of the median nerve, the test is considered positive.[15]

Nerve conduction velocity test

In order to evaluate nerve conduction velocity, the median nerve is stimulated at wrist flexion using a bipolar electrode, and the time it takes for the abductor pollicis brevis muscle action potential to develop is recorded. A conduction delay of up to 20 milliseconds can be indicative of carpal tunnel syndrome, even though normal conduction delays are less than five milliseconds. [16]

Square wrist sign

According to kuhlman et al., the two most sensitive symptoms were weakening of the abductor pollicis brevis (66%) and a square-shaped wrist, where the anterior-posterior dimension of the wrist (at the distal wrist crease) divided by the medio-lateral dimension is higher than 0.70.

Durkan's test

In durkan's test, the median nerve is gently compressed at the forearm, two to three centimeters above the carpal tunnel, with the thumb or two fingers. After roughly 20 seconds, the compression will result in tingling or numbness in the fingers if the test is positive.

Most workplace occurrences of carpal tunnel syndrome can be controlled with the use of these and other appropriate tests for early diagnosis. The prevention of cumulative trauma disorders, like carpal tunnel syndrome, is largely dependent on early detection and treatment.the path for treating carpal tunnel syndrome involves relieving the pain caused by compression of the median nerve.[18]

Preventive stratagies

"it is better to prevent than to cure." preventing any illness saves money, effort, and suffering. Musculoskeletal disorders (msds) are the prevalent disease among dentists, and ergonomics is the solution to this issue. For dentists to be healthier, there needs to be greater awareness of proper ergonomics.

Using a variety of ergonomic applications in dentistry, the key to a healthy practice is designing the work system with consideration for body posture, body movement, muscular strength, and body dimensions.
The following factors should be taken into account in order to prevent musculoskeletal disorders:
A)handling instruments
B)handling equipment
C) postures at work

Handling instruments

Instrument design
Goal: reduce force exertion; maintain hand/wrist in neutral position (no wrist bend)
The following factors should be considered

Overall shape, size
Handle shape, size
Weight
Balance
Maneuverability
Ease of operation
Ease of maintenance

Hand instrument: prefer hand instruments with hollow or resin handles; round, testured/grooves or compressibles handles; carbon steel construction and Colour coded instrument makes identification easier

Dental handpiece: when selecting handpieces, look for lightweight, balanced models; sufficient power; built in light sources;angles vs straight shank; pliable, lightweight hoses (extra length add weight); swivel mechanism; easy activation and

Easy maintenance. 15∘angle of the shaft to the working end, and a distance of approximately 26mm from working end to the angle allows stable unstrained wrist and upper arm with fine control

Handling equipment

Lighting: goal is to produce even, shadow free, colour corrected illumination Concentrated on operating field. Follwing factors should be considered overhead light should be readily accessible; hand mirrors can be used to provide light intraorally; Use of fiberoptics for handpieces and concentrated lighting to the operating field

Magnification: magnification gives the clinician the ability to see more clearly, maintain a longer working distance, and correct neck posture by preventing the clinician from bending forward toward the patient. For magnification systems, there are operating telescopes, microscopes, and dental loupes available. The dentist can concentrate their eyes on the operating field by using such equipment. Flexing the neck, upper back, or lower spine will not increase visibility.

Operator chair: it should promote mobility, patient access and accommodate different body sizes. Should have steady broad base and fully adjustable; adjustable lumbar suppor; seat height adjustment; adjustable foot rests; wrap around body support

Patient chair: it should promote patient comfort, maximize Patient access. Should be stable with fully adjustable head rest and have hands free operation. Should support patient's head, torso and feet

Work posture

Operator posture: patient should be positioned so that operator's elbows Are elevated no more than 30 degree. The operator should be able to sit tall in the chair, feet flat on the floor and thighs parallel to the floor. Operator's eye should be 14 to 16 inches from patient's oral cavity.shoulders should be relaxed not elevated
Patient posture: the patient is placed in supine position with back of the Dental chair almost parallel to the floor

In an area where there is proof of ergonomic disorders, the use of reinforced periodontal instrumentation techniques can prolong the practitioner's career. Reinforcement is the addition of another element or support to something in order to make it stronger. In order to aid the dominant hand during scaling, the non-dominant hand often holds a mirror for indirect vision. By utilizing both hands, the dentist can target the more powerful and larger arm muscles. The non-dominant hand applies additional pressure in the same direction as the dominant hand's fingers as the dominant hand adjusts and angulates an instrument's blade to fit tooth surfaces. This helps to safeguard operators during demanding and time-consuming instrumentation procedures.reinforced instrumentation techniques can help reduce hand, wrist, and arm pain in clinicians suffering from cumulative trauma injuries.[19]

Fulcrum

A finger rest known as a fulcrum is used to keep the clinician's hand steady while performing periodontal debridement. For stability, unit control, injury prevention, patient comfort, and stroke length control, a well-designed and functional finger rest is crucial.
A fulcrum can be used during scaling in three different categories.

Intraoral fulcrum

By stabilizing the clinician's dominant hand and keeping the pad of the ring finger on a tooth surface next to or near the tooth being instrumented, the standard intraoral fulcrum is established. In the field of dental hygiene, this scaling method is still considered the gold standard.[20]

Extraloral fulcrum

In order to stabilize the extraoral fulcrum, the clinician must place their dominant hand outside the patient's mouth that is in the cheeks, jaws, and chin. In contrast to intraoral finger rests, which provide support to the tips or pads of the fingers, extraoral fulcrums provide support to the front or rear of the fingers and hand. Actually, the fulcrum that stabilizes the working stroke is the patient's face's soft tissue and bone.[21,22] thus, extraoral hand rests rely entirely on a stable hand rest that applies pressure equivalent to what the blade does to the tooth. Depending on the kind of stroke that is activated, different pressure levels will be used. Extraoral fulcrums are useful because they make it easier to place instruments correctly, provide accurate angulation, enhance scaling precision, protect hands by placing them ergonomically so that the hand, wrist, and arm are in a neutral position, and provide pull strokes with the arm's larger muscle groups, which increase strength and power.

Reinforced fulcrum

Enhanced stability and control over the instrument have been achieved by using the reinforced fulcrum scaling technique when scaling with both the intraoral and extraoral fulcrum. Rather than holding the mouth mirror, the non-dominant hand is used to provide additional support for the instrument.[23] then, by applying pressure to the shank or instrument handle during a working stoke to obtain additional lateral pressure, the non-dominant hand's index and thumb can assist in supporting the structure.

Using the thumbs when utilizing reinforced instrumentation is also advantageous. Both hands can function as a single unit when the non-dominant thumb crosses over to the dominant thumb that is gripping the scaler. The bigger muscle groups in both arms can cooperate when both hands work together. Using extraoral reinforced techniques and scaling with both hands while applying thumb-to-thumb reinforcement will improve scaling efficacy and lower the risk of injury, particularly in patients with dense calculus. One of the greatest protective periodontal instrumentation strategies that the dentist can use in their regular practice to lessen the risk of musculoskeletal injuries to the hands, wrists, and arms is this one.the benefits of this technique include: improving both hands' balance; preventing instrument slippage; improving control over the instrument blade; increasing lateral pressure; increasing power; improving scaling efficiency; reducing hand, wrist, and arm pain; preventing musculoskeletal injuries; encouraging the use of larger muscle groups over smaller muscle groups to help prevent repetitive motion injuries; using finger retraction rather than mirror retraction to improve patient comfort; and helping those with hyperlaxity or flexible joints whose thumbs and fingers collapse when grasping and activating the instrument.[24,25]

Stretching

The majority of dental hygienists spend a lot of time sitting during the workday. Long periods of time spent seated still can lead to stiffness and tension in the muscles. Additionally, it results in weak muscles and restricted joint motion. This may put a person at risk for musculoskeletal injuries.dental hygienists can easily lower the risk of injury by doing exercises that lengthen and stretch the major muscle groups can greatly reduce the risk of injury.

Neck exercise

Neck stretch: tilt your head slightly to the side, bringing your ear close to your shoulder. After 15 to 20 seconds of holding, swap sides. To ease tension in the muscles of the neck, repeat three times on each side.

Neck rotation: as you slowly rotate your head to one side, try to line up your chin with your shoulder. Repeat on the opposite side after holding for 15 to 20 seconds. For better neck mobility, perform three sets on each side.

Shoulder exercise

Shoulder rolls:take ten seconds to roll your shoulders forward in a circle, then turn around. This exercise improves blood flow and helps to relax the shoulder muscles.

Shoulder blade squeezes: sit or stand up straight to perform shoulder blade squeezes. For five seconds, clench and then release your shoulder blades together. To strengthen your upper back, perform this exercise ten times.

Back exercise

Cat-cow stretch: aim to alternate between the downward-rounded cat pose and the upward-arching cow pose while on your hands and knees. To improve spinal flexibility, repeat these steps ten times over.

Back extensions: with your hands supporting you, slowly raise your upper body off the ground while lying face down. Hold for ten seconds before letting go. To strengthen the lower back, perform three sets.

Hip exercise

Hip flexor stretch: keeping your back straight, step forward with one foot into a lunge position. You should feel a stretch in the front of your hip by gently pressing your hips forward. After holding for 15 to 20 seconds, swap sides. On each side, repeat three times.

Seated hip opener: one ankle should be crossed over the other knee while sitting on a chair's edge. Feel the hip flex by lightly applying pressure to the elevated knee. Replace sides after holding for 15 to 20 seconds. For each side, perform three sets.

Wrist exercise

Wrist flexor stretch: with your palm facing up, extend one arm out in front of you. Gently bend your wrist downward with your opposite hand until your forearm stretches. After 15 seconds of holding, switch sides. On every side, repeat three times.

Wrist extensor stretch: keep your palm down as you extend one arm out in front of you. Bend your wrist slightly upward with your opposite hand until your forearm stretches. Switch sides after holding for 15 seconds. For each side, perform three sets.

It's crucial to take a few minutes during the day to stretch for the following reasons. It improves range of motion, which leads to increased flexibility; improves coordination, which improves control of fine motor skills; lowers tension by increasing blood flow and oxygen to the muscles; helps prevent sprains and strains in the muscles; improves psychological well-being by lowering stress; and encourages endurance during a demanding day.therefore, to promote proper sitting posture for career longevity, a good exercise regimen should be included to strengthen and balance postural muscles.[19]

II. Conclusion

Over the course of their career, dentists may work in strained and distorted positions for up to 60,000 hours, which can lead to musculoskeletal issues. Although good posture is not ideal for the dental field, it is possible to correct the bad postural habits that may be the source of this stress and pain with training and practice.in order to maintain optimal health throughout their careers, dental professionals need to take special exercise and ergonomic measures because they are susceptible to specific muscle imbalances. It's critical to understand which interventions work best as well as the best order in which to use them.start by implementing some of these recommendations into your daily workday routine to start changing the way you practice. You'll discover that you're less tired at the end of the day, that you're in less pain, and that you're able to give your patients the high-quality care that both you and they require.

Here are six wellness strategies that a dentist can implement to work more comfortably, feel less tired, and prolong their career:

1. Fix the operatory's ergonomic issues first and foremost.
2. For musculoskeletal disorders, physical therapists and neuromuscular therapists should be consulted.
3. Before beginning any strengthening exercises, major trigger points should be addressed.
4. Develop the strength of particular stabilizing muscles, such as the back and shoulders.
5. Exercise patience, but above all, make a commitment to a consistent preventive regimen.
6. Throughout the workday, chairside stretching is a crucial technique to avoid microtrauma and muscle imbalances.

Considering the impact of ergonomically designed and chosen equipment on the efficiency, one must modify the workplace to reduce the possibility of injuries. Among the various occupational hazards, msds are very much at the disposal of the clinician himself. By adopting newer techniques, armamentarium and work strategies can definitely prevent detrimental changes in the future.

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