Ergonomics Essentials:

Protecting Your Body While Caring for Your Patients

A deep dive into how poor posture silently erodes the health, performance, and careers of dental professionals — and what can be done about it.

Alex Pagotelis, MS, PT, JSCC

Today's Agenda

01 The Hidden Epidemic — MSDs in Dentistry

02 Your Body at Work — Anatomy of Dental Strain

03 Loupe Magnification & Equipment Ergonomics

04 Chair-Side Positioning & Workstation Setup

05 Stretching & Movement Protocols

06 Building Your Long-Term Prevention Plan

Section 01

The Hidden Epidemic: MSDs in Dentistry

The Numbers Don't Lie: MSDs in Your Profession

93%

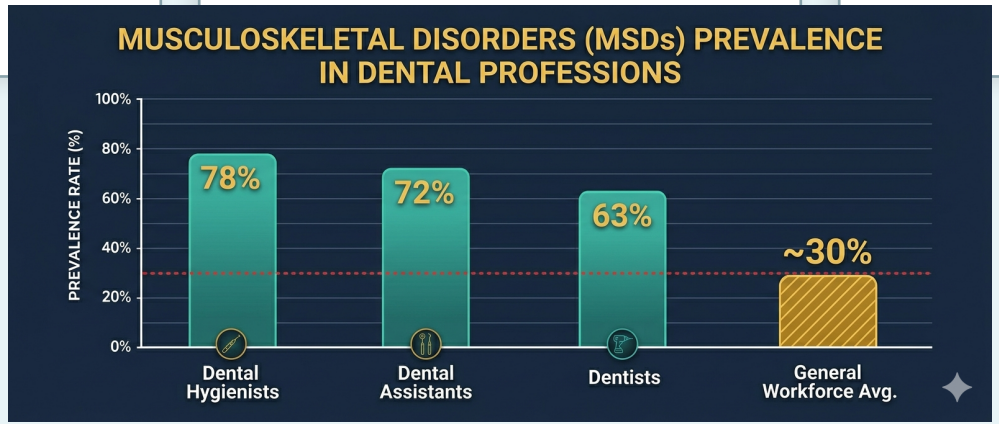
of dental hygienists report at least one MSD symptom in their career

60–80%

of dentists experience chronic musculoskeletal pain

1 in 3

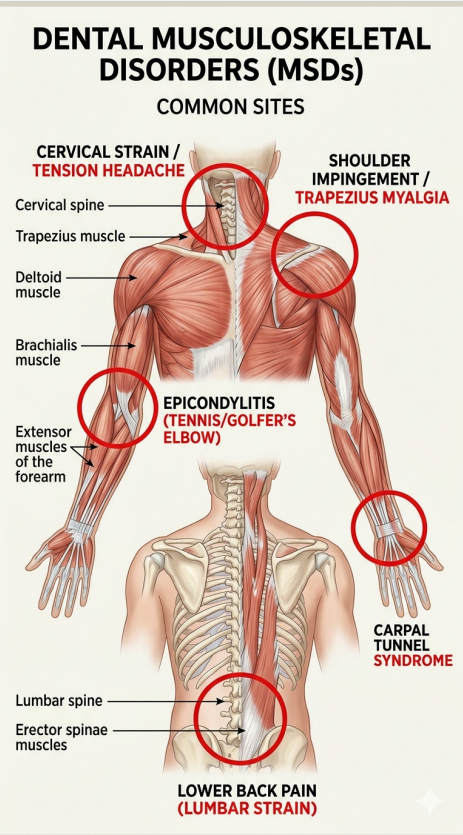
dental professionals consider early retirement due to pain



[1] Hayes et al. (2009). Ergonomics and the dental care worker. Am J Ind Med 52(7):585–92. [2] Leggat & Smith (2006). Musculoskeletal disorders self-reported by dentists in Queensland, Australia. Aust Dent J 51(4):324–7. [3] Valachi & Valachi (2003). Mechanisms leading to musculoskeletal disorders in dentistry. JADA 134(10):1344–50.

What Is a Musculoskeletal Disorder (MSD)?

- Injuries or disorders of muscles, nerves, tendons, joints, cartilage, and spinal discs
- Caused by repetitive motion, awkward postures, forceful exertion, and static loading
- In dentistry: prolonged static posture is the #1 driver — you hold positions for minutes at a time
- Unlike acute injuries, MSDs develop gradually — often called 'wear and tear' injuries
- Early detection and intervention dramatically change outcomes



[1] NIOSH (1997). Musculoskeletal disorders and workplace factors. DHHS Pub. No. 97-141. [2] Valachi & Valachi (2003). Mechanisms leading to musculoskeletal disorders in dentistry. JADA 134(10):1344–50.

Top 5 MSDs Affecting Dental Professionals

Carpal Tunnel Syndrome

Compression of the median nerve; aching, tingling in hand/fingers; worsened by scaling motions

Cervical Radiculopathy

Pinched nerve roots in neck; radiating pain to shoulder and arm; linked to head-forward posture

Rotator Cuff Tendinopathy

Inflammation of shoulder tendons; overhead reaching and sustained arm elevation are key culprits

DeQuervain's Tenosynovitis

Inflammation of thumb tendons; repetitive pinch and grip during instrument use

Lumbar Disc Pathology

Degeneration or herniation in lower back; caused by sustained trunk flexion and rotation during procedures

[1] Harutunian et al. (2011). Ergonomics and musculoskeletal pain among postgraduate students and faculty members. Med Oral Patol Oral Cir Bucal 16(3):e425–9. [2] Anton et al. (2002). Prevalence of musculoskeletal symptoms among dentists. J Dent 30(4):197–202. [3] Finsen et al. (1998). Musculoskeletal disorders among dentists. Appl Ergon 29(2):119–25.

The Real Cost: Beyond the Body

$50K

average cost of a workers' comp claim for an upper extremity

14 yrs

median career loss due to MSD-related early retirement in dental hygienists

4×

more likely to reduce clinical hours if pain is left unaddressed for >6 months

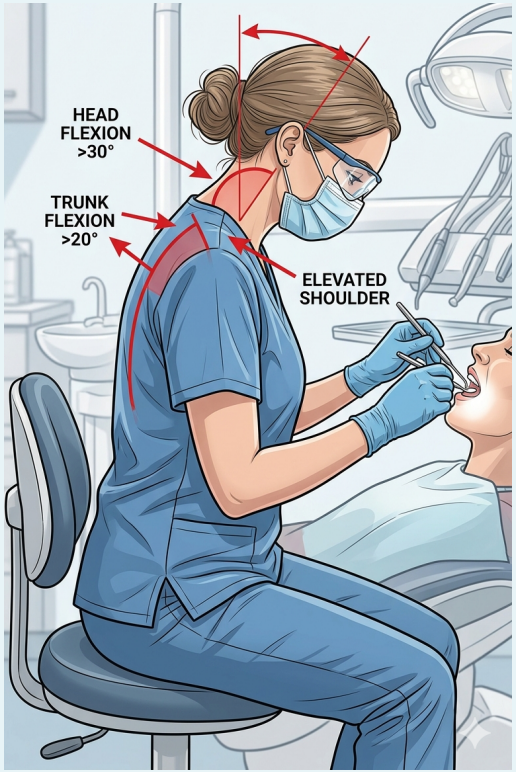
[1] U.S. Bureau of Labor Statistics (2022). Employer-reported workplace injuries and illnesses. [2] Hayes et al. (2009). Occupational musculoskeletal disorders among dental hygienists. Am J Ind Med. [3] Shugars et al. (1987). Perceived sources of stress among dentists. JADA 114(3):317–21.

Section 02

Your Body at Work: Anatomy of Dental Strain

The Dentist's Default Posture — A Recipe for Injury

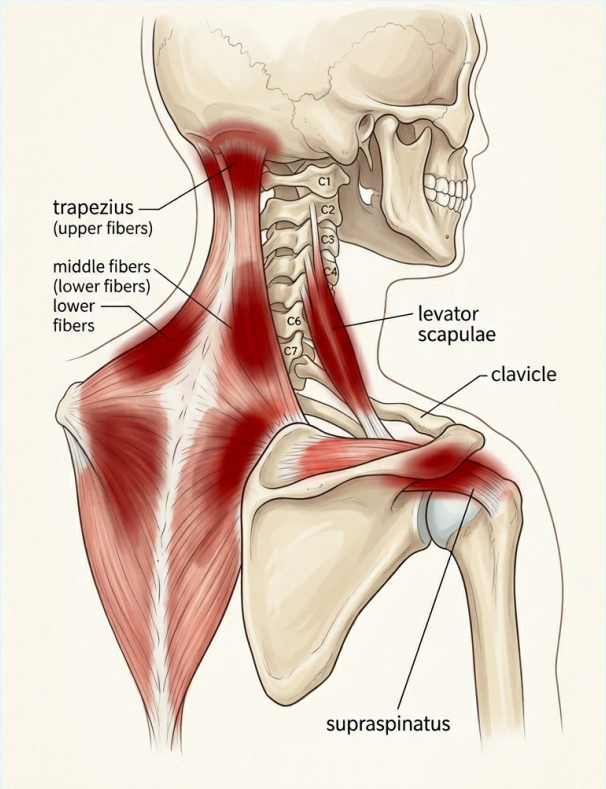
- Head-forward posture: for every inch the head moves forward, the neck bears ~10 additional pounds of load
- Sustained trunk flexion >20° is classified as a high-risk ergonomic position per REBA and OWAS standards
- Static shoulder elevation — even 10 – 15° held for minutes — compresses the supraspinatus tendon
- Pinch grip forces during hand scaling exceed 3 kg — far above the 0.5 kg muscle fatigue threshold
- Dentistry involves all four major MSD risk factors simultaneously: force, repetition, awkward posture, and contact stress



[1] Hansraj (2014). Assessment of stresses in the cervical spine caused by posture. Surg Technol Int 25:277–9. [2] Hignett & McAtamney (2000). REBA: Rapid Entire Body Assessment. Appl Ergon 31(2):201–5. [3] Dong et al. (2007). Pinch forces and muscle activity during a simulated dental hygiene task. Ergonomics 50(4):494–508.

The Neck & Shoulder: Dentistry's Most Vulnerable Zone

- Cervical spine supports the head (~12 lbs at neutral); forward head posture increases effective load up to 60 lbs at 60° flexion
- Upper trapezius and levator scapulae are chronically overloaded in dental work — trigger points are nearly universal
- The subacromial space narrows with internal shoulder rotation — a position common during lower arch procedures
- Static loading (no movement = no muscle pump) leads to ischemia and lactic acid accumulation in muscle tissue
- Pain referral patterns from cervical trigger points often mimic headache and eye strain



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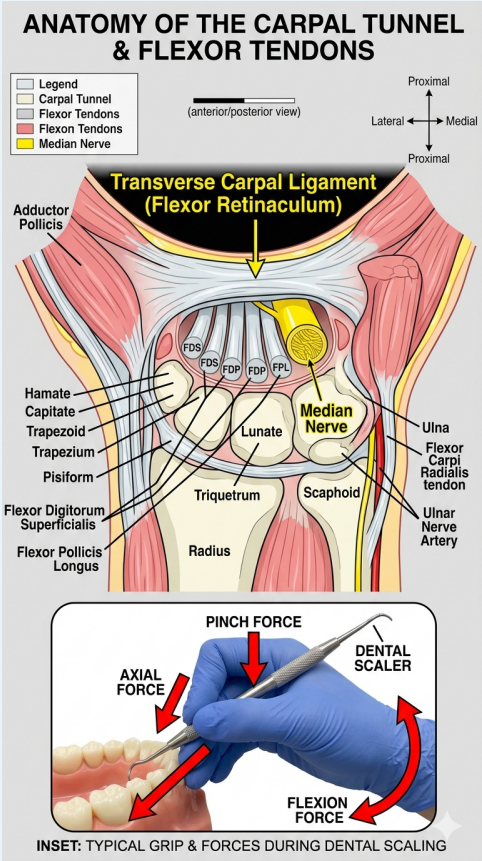
Wrists, Hands & Fingers: Where Precision Meets Pain

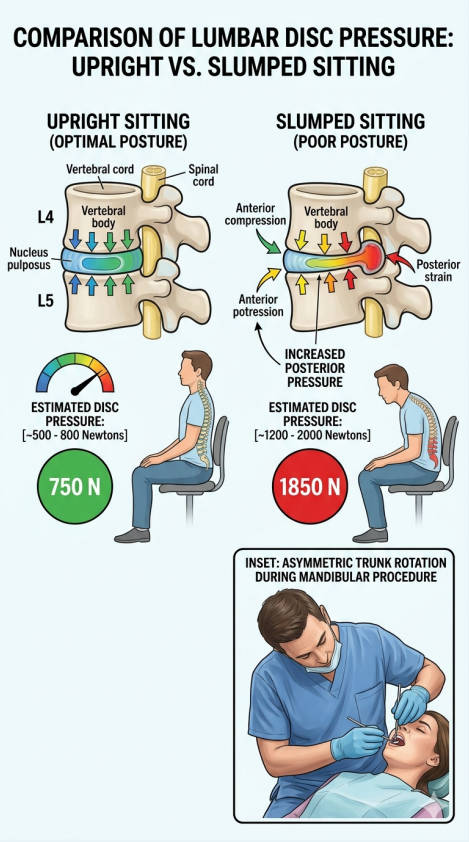
- The carpal tunnel houses 9 flexor tendons and the median nerve in a space the size of a pencil eraser
- Repetitive wrist extension + flexion during scaling inflames the flexor tendon sheaths
- Pinch and key-grip postures during instrument use are the #1 risk factor for DeQuervain's tenosynovitis
- Vibration from ultrasonic scalers further increases nerve compression risk (vibration-induced white finger)
- Dominant hand symptoms occur in ~80% of affected hygienists; non-dominant hand is often overlooked



[1] Dong et al. (2007). Pinch forces and muscle activity in dental hygiene. Ergonomics 50(4):494–508. [2] Lalumandier & McPhee (2001). Carpal tunnel syndrome: prevalence & diagnosis in dental hygienists. J Dent Hyg 75(2):156–61. [3] Werner et al. (2005). Occupational risk factors for CTS: a prospective study. Am J Ind Med 47(4):320–8.

The Lower Back: The Forgotten MSD Hotspot

- Intradiscal pressure is ~40% higher in slouched sitting than in upright sitting
- Twisting to access the patient + sustained flexion = combined loading — the most damaging lumbar stressor
- Sitting continuously for >1 hour reduces intervertebral disc hydration and increases herniation vulnerability
- Asymmetric seating (reaching across the body) creates lateral shear forces at L4–L5 and L5–S1
- Lower back pain is reported by 65% of dentists but is the least likely to prompt ergonomic changes



[1] Nachemson (1976). The lumbar spine: an orthopaedic challenge. Spine 1(1):59–71. [2] Skovron (1992). Epidemiology of low back pain. Baillieres Clin Rheumatol 6(3):559–73. [3] Finsen et al. (1998). Musculoskeletal disorders among dentists. Appl Ergon 29(2):119–25.

Recognize the Warning Signs Before They Become Injuries

🚨 Early Red Flags — Act Now

- Tingling or numbness in fingers at night
- Neck stiffness worse after procedures
- Shoulder pain reaching overhead (e.g., shelves)
- Thumb/wrist soreness after heavy scaling days
- Headaches beginning at the base of the skull

✅ When to Seek PT Evaluation

- Any symptom lasting more than 2 weeks
- Pain that wakes you from sleep
- Grip weakness or dropping instruments
- Symptoms that spread beyond original site
- Any prior MSD that resurfaces

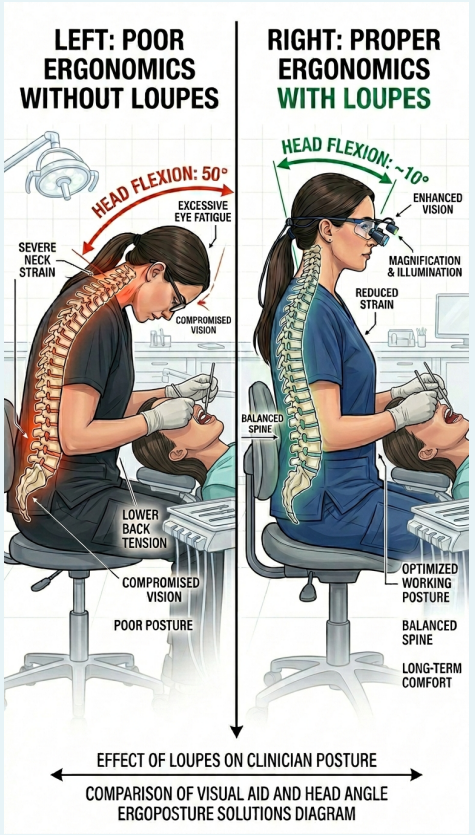
[1] American Physical Therapy Association (2021). Clinical practice guidelines: management of carpal tunnel syndrome. [2] Valachi (2018). Positioning for Prevention. Posturedontics Press, Portland, OR.

Section 03

Loupe Magnification & Equipment Ergonomics

Loupes: The Single Most Impactful Ergonomic Investment

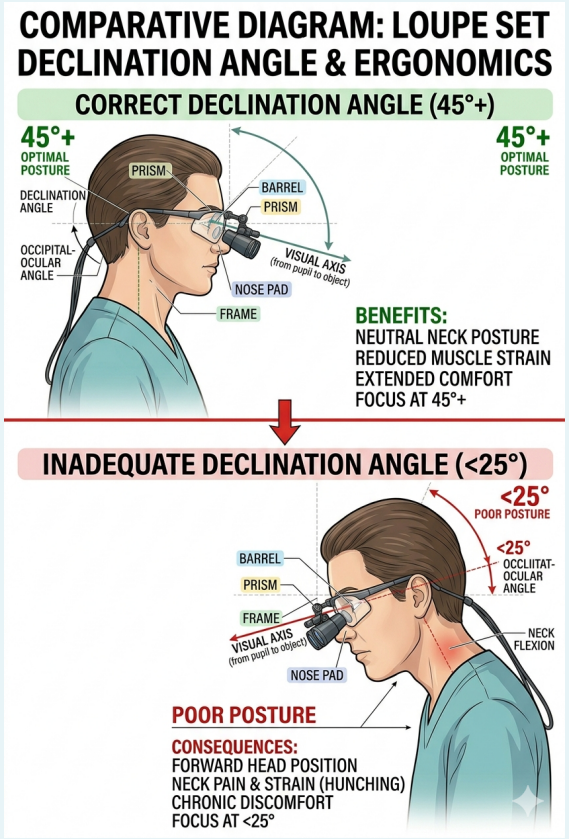
- Properly fitted loupes reduce working distance and head flexion by 20–40°
- Without loupes, dentists average 40–60° of head flexion — well into the pathological range
- With correctly fitted loupes, clinicians maintain near-neutral head posture of <15° flexion
- Key word: CORRECTLY FITTED — improperly fitted loupes create worse posture than no loupes at all
- Loupes should be treated as a clinical tool, not a luxury — return on investment is measured in career longevity



[1] Branson & Neck (2004). Postural considerations for the dental hygienist. J Dent Hyg 78(4):945–58. [2] Rucker & Sunell (2002). Ergonomic risk factors associated with clinical dentistry. J Calif Dent Assoc 30(2):139–48. [3] Valachi & Valachi (2003). Mechanisms leading to musculoskeletal disorders in dentistry. JADA 134(10):1344–50.

Loupe Fit: Declination Angle Is Everything

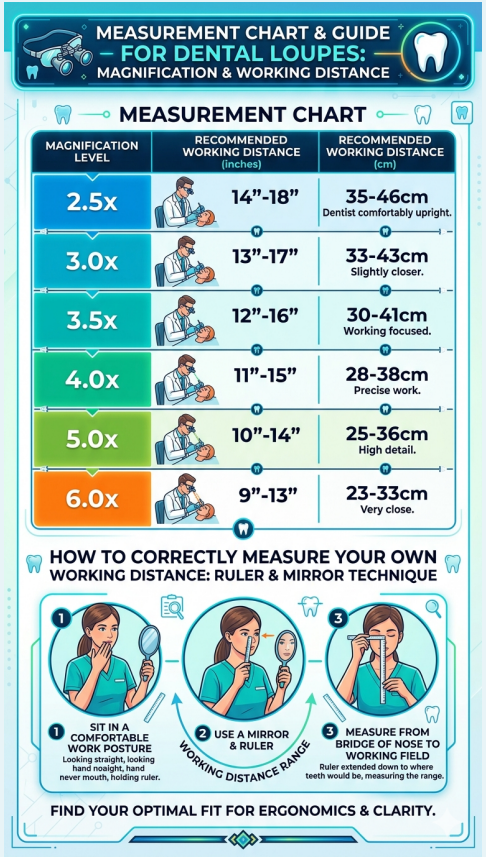
- Declination angle = angle at which the loupe barrels tilt downward from the horizontal plane
- Optimal angle: 45° or greater — allows the neck to remain in near-neutral position during procedures
- Most off-the-shelf loupes have a declination angle of only 20–25° — forcing the head forward
- Custom through-the-lens (TTL) loupes set to your specific working distance are the gold standard
- How to test your fit: neck should feel relaxed with eyes looking through the center of the barrel at your working field
- Re-evaluate declination every 2–3 years or whenever your working distance changes



[1] Rucker & Sunell (2002). Ergonomic risk factors associated with clinical dentistry. J Calif Dent Assoc 30(2):139–48. [2] Valachi (2018). Positioning for Prevention. Posturedontics Press, Portland, OR. Ch. 7.

Working Distance, Magnification & Prescription: Getting the Fit Right

- Working distance = distance from your eyes to the operative field — typically 14–20 inches
- Measure YOUR working distance, not an average — individual anatomy determines this number
- Common magnification levels: 2.5× (introductory), 3.5× (recommended minimum), 4.5× (advanced)
- Higher magnification = shorter working distance = greater risk of forward head posture if not properly fitted
- If you wear corrective lenses, build your prescription INTO the loupes — do not layer over contact lenses
- Weight of loupes matters: loupe + light systems >100g significantly increase cervical muscle fatigue



[1] Rucker & Sunell (2002). Ergonomic risk factors associated with clinical dentistry. J Calif Dent Assoc 30(2):139–48. [2] Chang et al. (2009). A study of musculoskeletal disorders in Taiwanese dentists. J Formos Med Assoc 108(6):465–70.

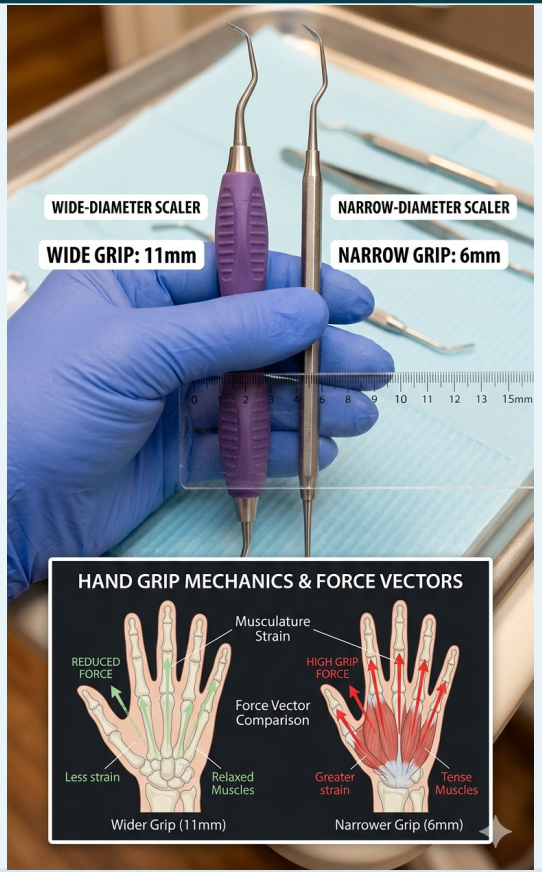
Headlights, Microscopes & Digital Technology

- Loupe-mounted LED headlights: align light with your line of sight, eliminate shadow-chasing postures
- Dental operating microscopes: provide superior magnification AND ergonomics — fully adjustable working angle
- Intraoral cameras and digital radiography reduce patient positioning stress but introduce screen-posture issues
- Voice-activated charting software can reduce mid-procedure head turns to computer screens
- Monitor placement: screen top at eye level, arm's length away (18–24 in.), directly in front — never rotated to the side

[1] Branson & Neck (2004). Postural considerations for the dental hygienist. J Dent Hyg 78(4):945–58. [2] OSHA (2020). Dental ergonomics eTool. osha.gov/dental.

Instrument Selection & Handle Ergonomics

- Larger diameter handles (10–15 mm) reduce pinch force by up to 35% compared to narrow-handled instruments
- Textured, non-slip grips reduce the force required — choose knurled or silicone-coated handles
- Lightweight instruments (<15 g) reduce cumulative fatigue during prolonged procedures
- Balanced instruments (center of gravity near the fulcrum) decrease wrist deviation requirements
- Sharpen hand instruments regularly — dull instruments require up to 30% more force per stroke
- Ultrasonic scalers reduce cumulative wrist force but introduce vibration risk — alternate with hand scaling



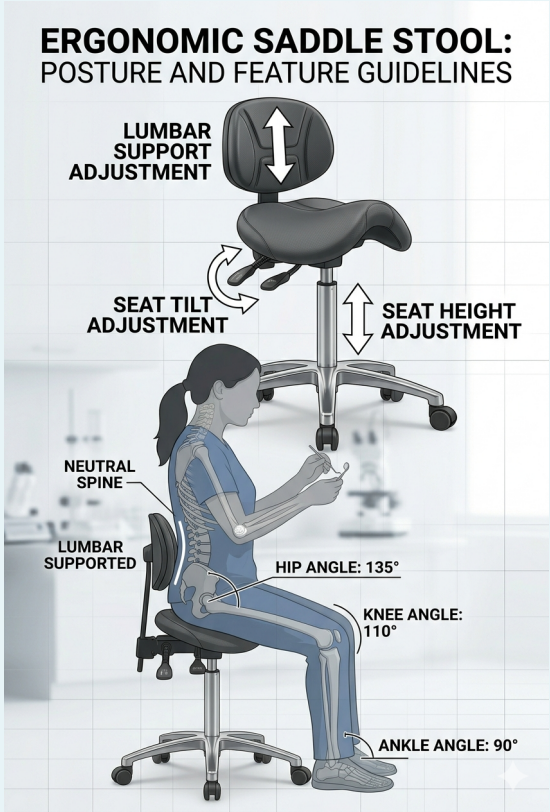
[1] Dong et al. (2007). Effect of handle design on pinch force in dental hygiene. Ergonomics 50(4):494–508. [2] Storfjell et al. (1996). Instrument handle size: effect on grip forces. J Dent Hyg 70(4):165–71. [3] Rempel et al. (1994). Fingertip forces during electronic product assembly. Ergonomics 37(10):1661–70.

Section 04

Chair-Side Positioning & Workstation Setup

Your Operatory Stool: Foundation of Ergonomic Posture

- Seat height: feet flat on floor, hips level with or slightly above knees (90–110° hip angle)
- Seat pan depth: 2–3 finger widths behind the knees — prevents popliteal vascular compression
- Lumbar support: should contact the lumbar curve, not flatten the back
- Saddle stools open the hip angle to 130–135° — significantly reduces lumbar disc pressure vs. flat stools
- Backrest: use during non-critical moments to offload spinal extensors between procedures
- Armrests: set to elbow height to support forearm weight and reduce upper trapezius loading



[1] Nachemson (1976). The lumbar spine: an orthopaedic challenge. Spine 1(1):59–71. [2] Gadge & Innes (2007). An investigation into the immediate effects of a saddle versus a standard chair. Phys Ther Rev 12(4):273–80. [3] Valachi & Valachi (2003). JADA 134(10):1344–50.

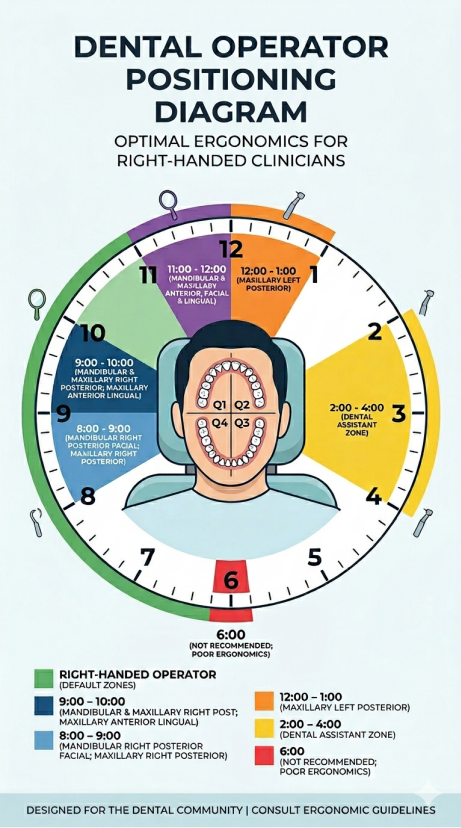
Patient Chair Positioning: You Control the Field

- Rule #1: Never compromise YOUR posture to accommodate the patient — adjust the chair to you
- Supine position for most procedures reduces the distance to the working field and allows neutral trunk posture
- Chair height: patient's mouth should be at or slightly below your elbow level when seated
- Headrest adjustability is critical — position the patient's head to eliminate the need for forward bending
- For mandibular anterior: tilt chair slightly back and drop headrest below horizontal
- For maxillary posterior: chin up, chair fully supine — avoid leaning over the patient

[1] Rucker & Sunell (2002). Ergonomic risk factors in clinical dentistry. J Calif Dent Assoc 30(2):139–48. [2] Valachi (2018). Positioning for Prevention. Posturedontics Press. Ch. 4.

The Clock System: Where Should You Sit?

- The patient's head is the center of a clock face — use clock positions to guide operator placement
- 8–9 o'clock (right-handed): ideal for most maxillary and mandibular posterior right quadrant procedures
- 11–12 o'clock: optimal for maxillary anterior and mandibular lingual access
- 9–10 o'clock (left-handed): mirrors the above recommendations
- Avoid 6 o'clock seating — forces extreme trunk extension and neck hyperextension
- Rotate between positions during long procedures to redistribute spinal loading



[1] Rucker & Sunell (2002). Ergonomic risk factors in clinical dentistry. J Calif Dent Assoc 30(2):139–48. [2] Valachi (2018). Positioning for Prevention. Posturedontics Press. Ch. 5.

Operatory Layout: Designing Your Ergonomic Environment

- Computer monitor: top of screen at eye level, arm's length away (18–24 in.), directly in front
- Mobile instrument trays: position within reach without trunk rotation — at 10–12 o'clock
- Delivery systems: over-the-patient or side delivery from 12 o'clock preferred over rear delivery
- Foot controls: placed to allow relaxed hip and knee angles — not stretched out in front
- Overhead dental light: position to eliminate shadow without requiring forward lean
- Anti-fatigue floor mats: recommended at all standing positions to reduce lower extremity fatigue

[1] OSHA (2020). Dental ergonomics eTool. osha.gov/dental. [2] Rucker & Sunell (2002). Ergonomic risk factors in clinical dentistry. J Calif Dent Assoc 30(2):139–48.

The Neutral Posture Checklist — 10 Points to Check Every Procedure

- ✓ Head upright — ears over shoulders, chin slightly tucked
- ✓ Eyes looking down through loupe barrels, not neck flexion
- ✓ Shoulders relaxed and level — not elevated or protracted
- ✓ Elbows close to torso — within 10–20° from neutral
- ✓ Wrists in neutral (not flexed, extended, or deviated)
- ✓ Hips slightly above knee level, weight evenly distributed
- ✓ Feet flat on floor or resting comfortably on stool ring
- ✓ Lumbar curve supported by stool back or lumbar roll
- ✓ No twisting — rotate the stool, not your spine
- ✓ Patient mouth at elbow height — adjust chair, not your posture

[1] Valachi & Valachi (2003). Mechanisms leading to musculoskeletal disorders in dentistry. JADA 134(10):1344–50. [2] OSHA (2020). Dental ergonomics eTool. osha.gov/dental. [3] Rucker & Sunell (2002). Ergonomic risk factors in clinical dentistry. J Calif Dent Assoc 30(2):139–48.

Section 05

Chair-Side Stretches & Movement Protocols

Why Movement Is Medicine for Dental Professionals

- Muscles held in static contraction for >4 minutes begin accumulating metabolic waste products (lactic acid)
- Micro-breaks of 20–30 seconds restore local blood flow and clear waste — preventing cumulative fatigue
- A structured stretch protocol reduces MSD incidence by 25–40% in high-repetition occupations
- You don't need a gym — 5–8 targeted exercises done between patients is sufficient
- Movement also reduces mental fatigue and improves fine motor precision for subsequent procedures
- Think of it like instrument maintenance — you clean your tools; now maintain the most important one: your body

[1] Sjøgaard et al. (2016). Exercise is more than medicine: the working age population's well-being. J Hum Kinet 52(1):5–11. [2] Verhagen et al. (2006). A one-season prospective cohort study of volleyball injuries. Br J Sports Med 38(4):477–81. [3] da Costa & Vieira (2010). Stretching exercises for MSDs in the workplace. Occup Environ Med 67(8):548–54.

Stretch #1–3: Cervical Release Series

- 1. Chin Tuck: Gently retract chin (create a 'double chin'), hold 5 sec × 10 reps. Targets deep cervical flexors. Perform hourly.
- 2. Levator Scapulae Stretch: Tilt ear to shoulder, rotate chin to armpit, apply gentle overpressure with hand. Hold 30 sec each side. Targets levator scapulae and upper trapezius.
- 3. Cervical Rotation: Slowly rotate chin toward each shoulder (no overpressure), hold 3–5 sec. 5 reps each direction between patients.
- Key cue: 'Stretch until you feel a comfortable pull — never stretch into pain'
- Frequency: Cervical stretches after every 2nd patient or every 45 minutes minimum

[1] Falla et al. (2006). Training the cervical muscles with prescribed motor tasks. Phys Ther 86(10):1543–53. [2] Gross et al. (2015). Exercises for mechanical neck disorders. Cochrane Database Syst Rev. CD004250.
[3] Valachi (2018). Positioning for Prevention. Posturedontics Press. Ch. 10.

Stretch #4–6: Shoulder & Upper Back Reset

- 4. Doorway Pec Stretch: Stand in doorway, forearms on frame at 90°, lean forward until stretch in pectorals. Hold 30 sec. Counters forward shoulder posture.
- 5. Scapular Retraction: Squeeze shoulder blades together and down, hold 5 sec × 10 reps. Can be done seated at your stool. Reactivates lower trapezius.
- 6. Shoulder Rolls + Shrugs: Full shoulder circles × 10 forward, × 10 backward; add 5 exaggerated shrugs + release. Clears trapezius tension between procedures.
- Perform these in your operatory — no extra space needed
- Performing these visibly normalizes self-care in front of patients and staff

[1] McClure et al. (2004). Shoulder function and 3-D kinematics in people with shoulder impingement syndrome. Phys Ther 84(9):832–48. [2] Cools et al. (2007). Trapezius activity and intramuscular balance during isokinetic exercise. J Athl Train 42(4):462–9.

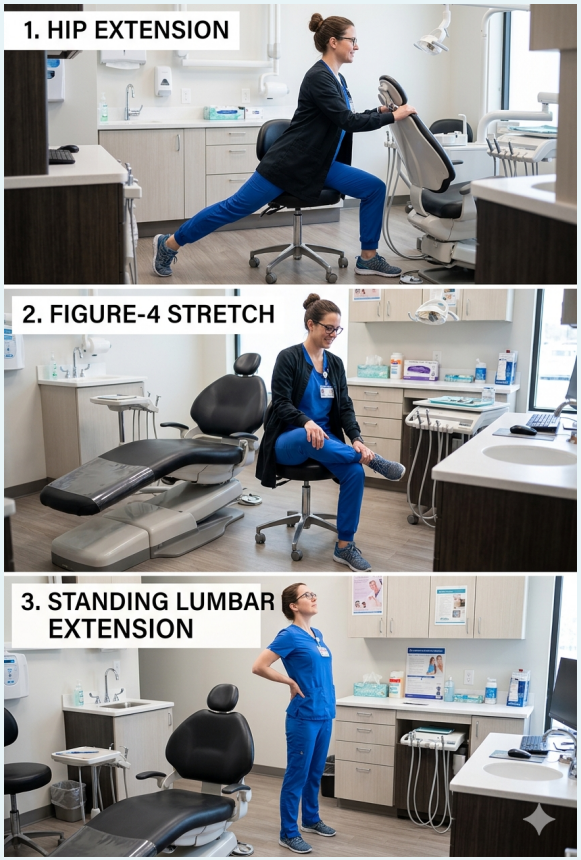
Stretch #7–9: Wrist, Forearm & Hand Recovery

- 7. Wrist Extensor Stretch: Arm extended, palm down, use other hand to gently flex wrist. Hold 30 sec. Targets extensor carpi radialis — chronically tight in scalers.
- 8. Wrist Flexor Stretch: Arm extended, palm up, gently extend wrist back with other hand. Hold 30 sec. Counters flexor tendon tightness from grip.
- 9. Finger Spread & Fist: Spread fingers wide, hold 3 sec; make a relaxed fist, hold 3 sec. 10 cycles. Promotes tendon gliding and reduces flexor sheath inflammation risk.
- Perform before your first patient, between difficult scaling cases, and at end of day
- Therapy putty ball exercises build intrinsic hand strength as a progressive rehabilitation step

[1] Backstrom (2002). Mobilization with movement as an adjunct intervention in lateral epicondylalgia. J Orthop Sports Phys Ther 32(3):86–92. [2] Michlovitz et al. (2004). Interventions for acute and chronic wrist/hand disorders. J Hand Ther 17(2):174–87.

Stretch #10–12: Lumbar & Hip Restoration

- 10. Seated Hip Flexor Release: Scoot to edge of stool, extend one leg slightly behind. Maintain upright trunk. Hold 20 sec each side. Addresses psoas tightness from prolonged sitting.
- 11. Piriformis/Figure-4 Stretch: Cross ankle over opposite knee while seated, gently press down on crossed knee, lean forward slightly. Hold 30 sec. Reduces sciatic nerve tension.
- 12. Standing Lumbar Extension: Hands on lower back, gently extend backward 5–10 reps. Counters sustained flexion posture. Perform every time you stand from your stool.
- Lumbar extension is the direct 'antidote' to the dental working posture — make it automatic



[1] McKenzie & May (2003). The Lumbar Spine: Mechanical Diagnosis & Therapy. Vol. 1. Spinal Publications NZ. [2] Nachemson (1976). The lumbar spine: an orthopaedic challenge. Spine 1(1):59–71.

The 3-Tier Movement Protocol: When & What to Do

Every 20–30 Min

- Chin tuck × 10
- Scapular retraction × 10
- Wrist circles × 10 each direction

Every Patient Turnover

- Levator stretch (30 sec each)
- Wrist extensor + flexor stretch
- Standing lumbar extension × 10

Morning & End of Day

- Full cervical stretch series (all 3)
- Doorway pec stretch
- Figure-4 hip stretch
- Finger spread & fist sequence

[1] da Costa & Vieira (2010). Stretching for MSDs in the workplace: a systematic review. Occup Environ Med 67(8):548–54. [2] Sjøgaard et al. (2016). Exercise is more than medicine. J Hum Kinet 52(1):5–11.

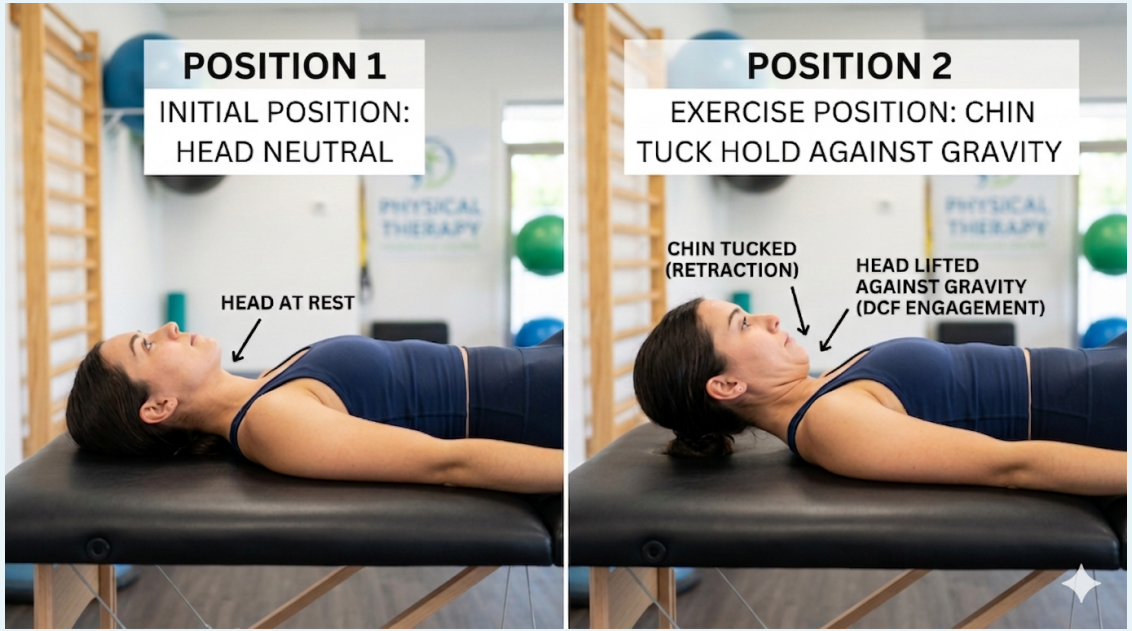
Section 06

Building Your Long-Term Prevention Plan

Off-Chair Training: Build the Body That Supports Your Practice 1 of 5

Deep cervical flexor strengthening: chin tuck holds against gravity

- 6-week protocol reduces neck pain by ~50%
- Tuck chin and lift head off surface about 1 inch for as long as you can x 5 reps



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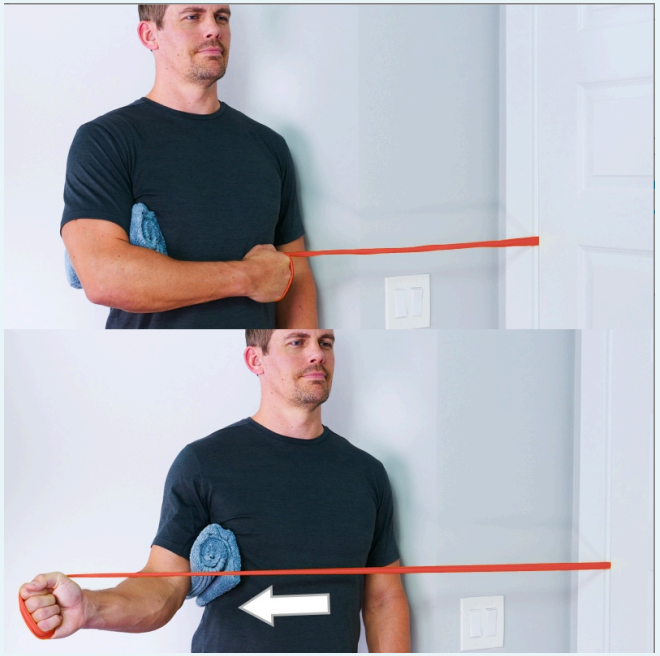
Off-Chair Training: Build the Body That Supports Your Practice 1 of 5

- Rotator cuff strengthening: external rotation with resistance band — 3 sets of 15, three times/week



Off-Chair Training: Build the Body That Supports Your Practice 1 of 5

Lower trapezius activation: prone Y's and T's

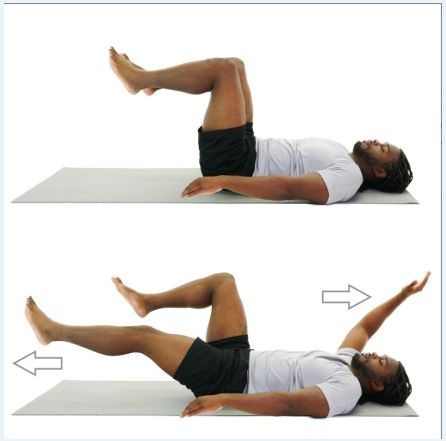
- Counteracts 'upper trap dominance' common in dental professionals
- Perform 10-15 reps x 2-3 sets
- Hold 5 seconds

Off-Chair Training: Build the Body That Supports Your Practice 1 of 5

Core stability: dead bugs, bird-dogs, and pallof press

- reduce lumbar disc loading by improving trunk stability

Dead Bugs



- 8-12 per side
- 1-3 sets

Bird-Dogs

- 8-12 per side
- 1-3 sets

Pallof

- Press out and hold 15-30 sec
- 1-3 sets per side

[1] Falla et al. (2006). Training the cervical muscles with prescribed motor tasks. Phys Ther 86(10):1543–53. [2] Cools et al. (2007). Trapezius activity and intramuscular balance. J Athl Train 42(4):462–9. [3] Cramer et al. (2013). Adverse effects of yoga. Eur J Integr Med 5(2):100–8.

Daily Habits That Compound Over a Career

- Schedule positioning self-checks — set a phone reminder every 30 minutes: 'Am I in neutral posture?'
- Rotate between seated and standing procedures to reduce cumulative static loading
- Hydrate — dehydrated intervertebral discs are mechanically weaker; target 2–3L of water per clinical day
- Alternate between hand and ultrasonic scaling to reduce repetitive strain on any single tissue
- Never eat lunch hunched over your phone — your break-time posture affects your afternoon spine loading
- Sleep position matters: avoid stomach sleeping (forced cervical rotation) or sleeping with arm overhead

[1] Adams et al. (1990). Diurnal variations in the stresses on the lumbar spine. Spine 15(2):130–7. [2] Wilke et al. (2016). Intradiscal pressure measurements: new information. Eur Spine J 25(2):413–22.

Working With a Physical Therapist: What to Expect

- A PT specializing in occupational health may be available in your area to perform a movement screen AND a workstation/posture assessment
- Treatment will vary depending on your symptoms — they can range from gentle techniques such as Fascial Counterstrain to activate exercises including Pilates.
- Typical results: 4-6 sessions to resolve most early-stage dental MSDs and 6-12 for chronic issues; maintenance may be necessary every 3–6 months
- Telehealth PT is now widely available — ideal for ergonomics coaching and exercise prescription
- Many dental societies have PT partnerships — ask your association what resources are available

[1] Bier et al. (2018). Exercise and advice in the management of neck and shoulder pain in physiotherapy. J Man Manip Ther 26(4):209–21. [2] American Physical Therapy Association (2021). APTA guide to physical therapist practice. apta.org.

It Takes a Team: Creating an Ergonomic Practice Culture

- Ergonomics is not an individual responsibility — it is a practice management issue
- Peer accountability: buddy up with a colleague to perform end-of-day stretching together
- Morning team huddle: add a 3-minute stretch routine before the first patient of the day
- Practice managers: schedule mandatory ergonomic equipment audits every 2 years
- Dental schools: ergonomics education should begin in preclinical year — not after injury occurs
- Consider hosting a quarterly PT-led in-service for your entire clinical team

[1] Ableser & Rozmovits (2012). Managing work-related musculoskeletal disorders. Ergonomics 55(2):200–12. [2] Dental schools ergonomics: Thornton et al. (2008). Dental ergonomics and musculoskeletal disorders. Angle Orthod 78(6):1072–6.

The Business Case for Ergonomics Investment

$500–2K

average annual investment in ergonomic equipment and PT maintenance

vs. $50K+

cost of a single workers' comp MSD claim — a 25× return on investment

5–10 yrs

additional clinical years gained by consistent ergonomic practice

[1] U.S. Bureau of Labor Statistics (2022). Employer-reported workplace injuries and illnesses. [2] Liberty Mutual (2022). Workplace safety index: cost of disabling injuries. [3] Hayes et al. (2009). Occupational musculoskeletal disorders among dental hygienists. Am J Ind Med 52(7):585–92.

Your 30-Day Ergonomic Action Plan

Week 1

- Audit your loupe declination angle
- Set up your neutral posture checklist in room
- Start the 3-tier micro-break protocol

Week 2

- Book a posture screen with a PT, if available.
- Measure your working distance; contact loupe provider
- Add morning stretching × 5 min before first patient

Week 3

- Reassess patient chair positioning habits
- Trial a saddle stool if not already using one
- Start resistance band shoulder exercises 3×/wk

Week 4

- Evaluate your room layout with a colleague
- Schedule a 6-month ergonomic follow-up reminder
- Share this protocol with your entire team

[1] Valachi (2018). Positioning for Prevention. Posturedontics Press. [2] OSHA (2020). Dental ergonomics eTool. osha.gov/dental.

Key References

1. Valachi & Valachi (2003). Mechanisms leading to MSDs in dentistry. JADA 134(10):1344–50.

2. Hayes et al. (2009). Ergonomics and the dental care worker. Am J Ind Med 52(7):585–92.

3. Finsen et al. (1998). Musculoskeletal disorders among dentists. Appl Ergon 29(2):119–25.

4. Hansraj (2014). Assessment of stresses in the cervical spine caused by posture. Surg Technol Int 25:277–9.

5. Dong et al. (2007). Pinch forces and muscle activity during simulated dental hygiene. Ergonomics 50(4):494–508.

6. Nachemson (1976). The lumbar spine: an orthopaedic challenge. Spine 1(1):59–71.

7. Rucker & Sunell (2002). Ergonomic risk factors associated with clinical dentistry. J Calif Dent Assoc 30(2):139–48.

8. Lalumandier & McPhee (2001). CTS: prevalence & diagnosis in dental hygienists. J Dent Hyg 75(2):156–61.

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10. Falla et al. (2006). Training the cervical muscles with prescribed motor tasks. Phys Ther 86(10):1543–53.

11. McKenzie & May (2003). The Lumbar Spine: Mechanical Diagnosis & Therapy. Spinal Publications NZ.

12. Valachi, B. (2018). Positioning for Prevention. Posturedontics Press, Portland, OR.

13. NIOSH (1997). Musculoskeletal disorders and workplace factors. DHHS Pub. No. 97-141.

14. OSHA (2020). Dental Ergonomics eTool. U.S. Dept. of Labor. osha.gov/dental.

Questions & Discussion

"Your career is your most valuable instrument.
Tune it, maintain it, and it will last a lifetime."

Contact Information

you turn physical therapy

NAME

Alex Pagotelis

BIO

Owner/Physical Therapist at You Turn Physical Therapy