

Ergonomics in the Operator: Protect Your Health for a Lifetime of Practice



For Jessica Suedbeck, RDH, MSDH, the reality of ergonomic strain became clear early in her career. “I practiced for a couple of years,” she said, “and it was obvious that the long-term sustainability of dental hygiene is difficult because of ergonomics.”

That realization shaped her professional trajectory. After earning her degree in dental hygiene, Suedbeck pursued graduate study focused on ergonomics. Her master’s thesis examined instrument handle design and how ergonomic modifications could help reduce strain. Today, as an associate professor at Old Dominion University and a PhD candidate in kinesiology, she continues to study ergonomics and repetitive strain.

Movement specialists like Rick Williamson, CPT, see what happens when ergonomic principles are ignored. Many dental professionals come to him with the same concern: “How much longer will I be able to practice?”

START WITH AWARENESS

Most hygienists study ergonomic principles in school, but those principles can fade over time. According to Suedbeck, one common mistake stems from a desire to accommodate patients. “I tell students, ‘Ask your patient to move to you. You don’t crane to them.’”

Changing long-standing habits can be difficult. That’s why Suedbeck encourages clinicians to consider equipment that promotes healthier positioning. Ergonomic loupes, for example, are designed to keep clinicians upright while working.



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POSTURE AND MOTION

While maintaining neutral posture is important, Williamson noted that remaining in any static position for long periods can create problems.

“We’re not designed to sit at 90 degrees all day,” he explained. “It shortens hamstrings and hip flexors. That causes lower back pain, hip pain, and loss of hip mobility.” Dynamic seating can help by allowing the body to move naturally during procedures. “When you move, the stool moves with you,” Williamson explained. “It reduces force in the pelvis.”

He also encourages clinicians to sit as high as comfortably possible to keep hips open. “We’re not designed to be bent over all day. We’re designed to go into those positions for a short period and then return to neutral.”

Suedbeck said clinicians don’t always need to sit. “We learn in school to sit to perform procedures, but sometimes standing allows you to stay more neutral.”

Beyond posture, Suedbeck’s research identifies repetitive motion during procedures as a major contributor to musculoskeletal disorders in dental hygiene.

"Everything we do is a repetitive stroke," said Suedbeck. Her research explores ways to reduce repetitive strain. One idea involves alternating instrument handle designs between patients to vary muscle activation patterns. While larger-diameter instruments reduce pinch force and muscle activity, she believes variation itself may offer additional protection.

Williamson sees how repetitive positioning gradually alters the body.

"The muscles change the position of the bones, which change the position of your spine," he said. "That leads to pain."

THE WARNING SIGNS

Musculoskeletal disorders often develop gradually, making them easy to overlook. "At first, it's pain after providing care," Suedbeck said. "But then it doesn't go away."

Pain that persists outside working hours—or disrupts sleep—signals a more serious issue. The good news is that early intervention can prevent long-term damage. "Hygienists can prevent that damage from getting worse by changing habits," said Suedbeck.

RETRAINING THE BODY

Williamson emphasizes a simple concept he calls "engage and disengage."

"Engaged means you're working—you're in forward flexion," he explained. "Disengaged means you're standing or sitting in neutral, vertical posture." The key is recognizing the moment when work stops and resetting posture. "Don't talk to the patient in the same position you're working in," he said. "Sit up. Find neutral as many times a day as you can."

Staying physically active outside the practice helps. "Any type of exercise outside the workplace will help prevent musculoskeletal disorders," Suedbeck said.

Common Causes of Pain for Dental Professionals



Hygienists and dentists experience high rates of musculoskeletal pain due to the physical demands of clinical work. Body Praxis, a rehabilitation program developed by Rick Williamson, emphasizes how workplace ergonomics, posture, and repetitive movement patterns can play a significant role in these problems.

Why Pain Develops in Dental Practice:

- **Repetitive movement patterns:** Performing the same motions repeatedly with little variation contributes to muscle fatigue and compensatory movement patterns.
- **Static and awkward postures:** Long periods of forward flexion and rotation increase strain on the neck, shoulders, back, hips, and pelvis.
- **Muscle imbalances:** Overused muscles fatigue while underused muscles weaken, reducing support for the spine and joints.
- **Hip and pelvic dysfunction:** Prolonged sitting at a 90-degree angle shortens hip flexors, contributing to lower back and hip pain.
- **Shoulder elevation strain:** Holding instruments or equipment above shoulder height increases tension in the shoulders and may lead to impingement or nerve symptoms.

Strength training and cardiovascular fitness support the muscles surrounding heavily used joints. She also advocates for collaboration with physical therapists. "Physical therapy focuses on strengthening the muscles around joints—and that's what we need in dentistry."

INVESTING IN LONGEVITY

Suedbeck has seen ergonomics become more prominent in dental education. "When I first started, ergonomics was almost an afterthought," she said. "Now it's embedded in the curriculum."

Today, clinicians can attend CE courses focused on ergonomics, and manufacturers increasingly seek evidence-based guidance when designing equipment.

"Hygienists want career longevity," Suedbeck said. "They don't want to retire early."

Ergonomic loupes, seating, instruments, and other supportive tools carry a price tag, but Suedbeck frames them as long-term investments. "They're investments in your career, your longevity, and your health," she said.

Williamson echoes that message in a summary at the end of his presentations:

"Why am I in pain? Repetitive movement patterns, faulty posture, and poor ergonomics. How do I get out of pain? Oppositional movement patterns, correct breathing, and postural and spatial awareness. How do I make it permanent? Practice, practice, practice."